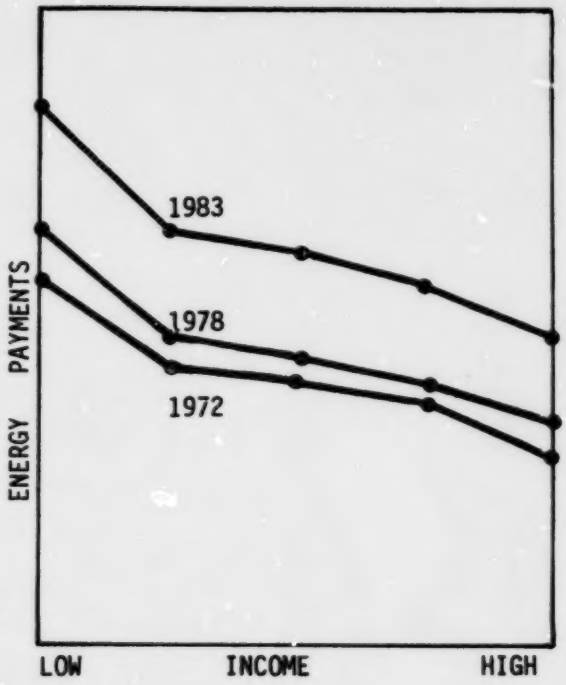


The Impact of Rising Energy Prices on Low Income Households

SOCIAL PLANNING
COUNCIL
OF
METROPOLITAN
TORONTO

A participant in the United Way

THE POOR AND RISING ENERGY PRICES:

THE IMPACT OF RISING ENERGY PRICES ON LOW INCOME HOUSEHOLDS

September 1984

by

Jeffrey Patterson

Copyright © 1984 by:

The Social Planning Council of Metropolitan Toronto
185 Bloor St. East
Third Floor
Toronto, Ontario, M4W 3J3

Title: The Poor and Rising Energy Prices:
The Impact of Rising Energy Prices on Low Income Households

ISBN: 0-919456-22-7

Project Staff

Jeffrey Patterson
Co-ordinator and Principal Consultant

David Thornley
Researcher

Barbara Woolley
Secretary and Manuscript Typist

Price: $9.00

ABSTRACT

National energy policies -- energy supply and consumption objectives and energy prices -- have distributional consequences on different families, individuals, and other consumers. Different households consume varying amounts of energy, and they use it for varying purposes. Of primary concern to housing agencies is the consumption of energy for water and space heating, for lighting and other household uses, and for daily travel needs between home and work and home and other daily activities.

This report seeks to measure the differential impact of rising energy prices on different households, especially on the poor. It discusses the effect of existing energy and conservation policies and government programs on the poor, and proposes ways and means of ameliorating undesirable effects within the context of overall national energy policies.

This study was conducted by the Social Planning Council of Metropolitan Toronto for Canada Mortgage and Housing Corporation under Part V of the National Housing Act. The analysis, interpretations and recommendations are those of the consultants and do not necessarily reflect the views of Canada Mortgage and Housing Corporation or those divisions of the Corporation that assisted in the study and its publication.

CONTENTS

List of Charts	vii
List of Tables	viii
Acknowledgements	ix
Summary	xi
INTRODUCTION	1.
The Range of Potential Responses to the post 1973 World Energy Environment	5.
The Responsibility of Government	5.
Plan of the Report	9.
Chapter 1: A REVIEW OF HOUSEHOLD SPENDING ON ENERGY, 1955 - 1980	11.
The Distributional Impact of Energy Prices	11.
Sources for Examining the Relationship Between Income and Direct Energy Expenditures	11.
Methodological Limitations	13.
A Methodology for Estimating the Incidence of Direct Energy Costs by Income Class	16.
Household Energy Expenditures	20.
Summary	25.
Chapter 2: THE IMPACT OF CHANGES IN ENERGY PRICES ON DIFFERENT INCOME GROUPS	27.
Estimated Changes in Energy Expenditures from 1978 to 1983 by Income Class	33.
Regional and Inter-City Variations	34.
Variations in the Relationship Between Energy Costs and Disposable Income by Household Type	38.
Summary	42.

CONTENTS (cont.)

Chapter 3: THE POLICY ISSUES AND POLICY RECOMMENDATIONS	45.
The Best Policy Would Be An Incomes Policy	45.
Why Develop Specific Programs for Poor Canadians?	46.
A Note on the Recent Stability of Energy Prices	49.
Policy Principles	50.
Low Income Target Groups	51.
Existing Energy Policies and Programs for Low Income Households	52.
Provincial Programs	56.
Policy Discussion	58.
Criteria to Assess Policies	60.
The Pluses and Minuses of Various Energy Policies from the Point of View of Low Income Consumers	61.
Policy Assessment	68.
Recommendations	70.
Future Research Needs	71.

LIST OF CHARTS

Figure 1:	Changes in Energy Prices, 1955 - 1983	4.
Figure 2:	Illustration of Estimated Incidence of Tax and Sharing of Revenues (Spring 1982 - ¢/litre gasoline)	8.
Figure 3:	Proportion of Disposable Income Spent on Energy, By Income Class, 1978	22.
Figure 4:	Proportion of Energy Expenditures on Oil and Gas, Electricity and Transportation By Income Class, 1978	24.
Figure 5:	Per Cent Changes in Disposable Income Adjusting for Impact of Rising Direct Energy Prices by Income Quintile, 1972 - 1978	30.
Figure 6:	Comparison of Selected Energy-Related Variables, 1978 and 1980	48.
Figure 7:	Variation in Space Heating Expenditures, 1979 (By Income)	59.

LIST OF TABLES

Table 1:	Increases in Energy Prices (C.P.I.), 1955 - 1983	3.
Table 3:	Proportion of Disposable Income Spent on Energy by Income Class, 1978	21.
Table 4:	Proportion of Energy Expenditures on Oil and Gas, Electricity and Transportation by Income Class, 1978	23.
Table 5:	Comparison of the Proportion of Disposable Income Spent on Energy by Individually-Metred Households in 1972 and 1978 (By Quintile and Use of Car)	28.
Table 6:	Changes in Energy Use by Income Quintile, 1972 - 1978 (Per Cent)	31.
Table 7:	Proportion of Disposable Income Spent on Shelter Energy, and All Household Energy, 1972, 1978 and 1983 (Estimated)	35.
Table 8:	Average Cost of Energy Used by City, 1978	37.
Table 9:	Average Energy Expenditures as Per Cent of Disposable Income by Income Group and by City, 1978	39.
Table 10:	Shelter Energy Expenditures by Larger and Older Households Reporting Energy Purchases, 1978	41.
Table 11:	Characteristics of Income Quintiles, 1978	52.
Table 12:	Summary of Provincial Energy Conservation Programs	57.
Table 13:	Expenditures on Appliances and Vehicles, 1978 (By Income Class)	67.

ACKNOWLEDGEMENTS

The Social Planning Council of Metropolitan Toronto is grateful for the assistance of Michael Miloff in undertaking the original and detailed research on this subject in 1980, on which this summary and updated report is based. The Council acknowledges the contribution of the staff of the Canada Mortgage and Housing Corporation national office in making this report possible, including John Engeland, who facilitated this report by processing data from Statistics Canada's 1978 Family Expenditure Survey.

As always I am grateful for the helpful assistance of my colleagues at the Social Planning Council for their help, especially to David Thornley for his research assistance and to Barbara Woolley for her speedy and accurate typing of various drafts, as well as the final manuscript.

Jeffrey Patterson

SUMMARY

Until 1973 the consumption of energy in Canada was characterized by declining real prices and by the gradual substitution of energy for human labour. In the late 1960s Canada surpassed the U.S.A. as the biggest per capita consumer of energy. The 1973 decision of the Organization of Petroleum Exporting Countries to take advantage of their monopoly position by increasing prices and curtailing supplies turned around the decline in real prices. The well-head price of oil in the OPEC countries increased ten-fold from October 1973 to late 1982 when prices peaked. At the consumer level, home heating oil was six times more expensive in 1983 than in 1971. Gasoline prices increased by 350 per cent and natural gas prices by almost 400 per cent.

The Government of Canada responded to these events, beginning in 1973, with a variety of policies and programs and then, in 1980, with a comprehensive National Energy Program. These policies and programs can be said to have had three objectives: 1) to ease the burden of rising prices on consumers in general, and especially consumers in eastern Canada dependent on foreign oil imports; 2) to satisfy the desire for increased royalty and other energy revenues on the part of the producing provinces, primarily Alberta, Saskatchewan and British Columbia, and potentially Nova Scotia and Newfoundland, and to raise additional energy revenues for the Government of Canada; and 3) to improve security of supply of oil and increase Canada's oil self-sufficiency. Easing the burden of increasing energy prices on consumers and granting consumers extra time during which to adjust to increased energy prices was a major goal of national energy policies.

This report focuses primarily on direct energy expenditures for electricity, for home space and water heating, and personal transportation. It is contended that indirect spending on energy, that is energy costs embedded in the costs of other goods and services, are more or less proportional to income, and that it is the direct expenditures that vary most for households at different income levels. If households are divided into income quintiles, each quintile representing one-fifth of all households, Statistics Canada's 1972 family expenditure survey showed that direct energy expenditures totalled 8.5 per cent of income for the lowest income quintile, ranging downward to 4.4 per cent for the highest income quintile. By 1978 the lowest and the highest income quintiles were paying 9.7 and 5.2 per cent of their incomes respectively for direct energy consumption.

It is estimated that in 1983 the lowest and the highest income quintiles were paying 12.5 and 7.3 per cent of their incomes respectively for direct energy consumption. The poor paid a much larger share of their income for direct energy consumption at the beginning of the period of rapid price increases and subsequently the lowest income quintile had seen the percentage of their income devoted to direct energy consumption increase by 4.0, while the highest income quintile had an increase of 2.9.

The above data represent averages for large urban centres. Even more importantly, there are large variations above and below these averages for particular cities and for different household types. It is estimated that by 1983 the lowest income quintile in St. John's may have been paying 19 per cent of their income for direct energy consumption. In 1978 direct energy expenditures were 6.4 per cent of income for families of two or more in the lowest quintile and 7.0 per cent of income for elderly couples in the lowest income quintile. It

is shown that increasing energy prices are regressive with respect to income. Energy policy and programs in the past have not specifically considered low income groups, and a change in policy principle is recommended.

The design and use of existing government programs, both federal and provincial, is reviewed. While some programs, particularly the Canada Home Insulation Program (CHIP) and the Canada Oil Substitution Program (COSP), through taxable grants and maximum grant amounts, provide greater net benefits to lower income users than higher income users, there is no program which shows a preference for the poor over the rich.* There is evidence that the poor try to conserve energy by turning down their thermostats at least as often as more affluent households, and by curtailing car travel to a greater extent than higher income groups. There is also evidence that they have been less successful than higher income quintiles in conserving energy for space heating. It follows that the inability to purchase more modern equipment, increased insulation and so forth may be at least one reason for this failure, and that programs which facilitated these investments would be effective.

The main recommendation of this report is that there is a need for a new energy conservation assistance program that targets grants more specifically to low income Canadian households and that the new program should replace the existing CHIP and COSP programs.

---

*Governments pay for the operating losses of subsidized housing projects, including energy costs, and provide allowances for energy use for welfare recipients, but these are not usually considered energy programs.

INTRODUCTION

The recent history of Canada and consumption of energy by Canadians was, until 1973, characterized by declining real prices of energy and energy commodities and by the gradual substitution of energy for human labour. In both their home and work Canadians had progressively more labour-saving devices available to them with each passing year. Energy consumption grew more rapidly than the economy as a whole. Energy consumption up to 1973 was also characterized by increasing reliance on oil for both home heating and transportation and on non-renewable energy.

On an international scale Canadians are extensive users of energy. In the late 1960s Canada surpassed the U.S.A. as the biggest per capita consumer of energy.[1] In the late 1970s Canada became the heaviest user of energy per unit of economic output. Canada used more energy for each unit of gross national product or economic production than any other major nation. By 1979 per capita consumption in Canada was nearly eight per cent greater than the second place nation, the United States.[2]

While increased energy use was associated with unprecedented growth in economic productivity, the trends in energy use of the 1950s and 1960s could not be sustained indefinitely. More and more oil and gas were used. World wide oil production was increasingly concentrated in a few countries, especially in the Middle East. They began to perceive that their resources were being used to buttress

---

1. Bobbi Cain, International Energy Comparisons: A View of Eight Industrialized Countries, Discussion Paper 222 (Ottawa: Economic Council of Canada, December 1982), Chart I.
2. Ibid, p.7.

and increase living standards in the west and to increase the profits of the large oil producers at the expense of their own present and future welfare. The Organization of Petroleum Exporting Countries (OPEC) was established in 1961. However, it was not until 1973 that the OPEC nations, which includes all of the major oil-producing nations except those in Europe, North America and the Soviet bloc, decided to exert their economic muscle and assure their continued future wealth by restricting oil exports, increasing production royalties and, in some cases, taking over production and distribution directly.

The resulting shock continues to reverberate throughout the western industrial economies and continues to be blamed for the sluggish economic performance that characterized the succeeding decade.

The well-head price of oil in the OPEC countries increased by ten-fold in a decade in which overall prices increased two-and-one-half times.[3] In October 1973 the posted price of Middle-East oil was $3.65 a barrel. The price peaked at $38 a barrel in late 1982. From two to three per cent of the world's gross product was transferred from oil-consuming to oil-producing nations.

Viewing the spiraling oil prices from the perspective of the consumer, the price of fuel oil in constant dollars had increased by less than two per cent in the 16 years between 1955 and 1971. In the 12 years between 1971 and 1983 the price of home heating oil increased by over 600 per cent. Gasoline prices increased by 350 per cent and natural gas prices by almost 400 per cent. Overall, the energy component of the consumer price index (CPI)

---

3. The Consumer Price Index for all items in Canada for 1983 was 2.497 times the price level in 1973.

increased by 360 per cent in current dollars from 1971 through 1983. The 50 litre gas tank fill-up that would have cost the owner of a modest sedan $5.00 in 1971 cost over $23.00 in Ontario in 1983.[4] Table 1 and Figure 1 contrasts the spiraling energy prices experienced since 1973 with the stability of the cost of energy from 1955 to 1973.

Table 1

Increases in Energy Prices (C.P.I.), 1955 - 1983, 1955 = 100

	All Items	Gasoline	Home Heating Oil	Natural Gas	Electricity
1983*	417.0	546.4	750.4	507.0	377.0
1981	351.0	399.8	544.3	363.5	311.8
1979	283.3	247.0	315.8	255.3	262.3
1977	238.2	212.2	246.3	203.8	223.3
1975	205.2	173.8	183.7	139.7	164.6
1973	167.0	131.7	125.2	105.0	142.1
1971	148.1	122.4	101.9	102.6	127.9
1969	139.4	115.7	91.0	102.4	113.8
1967	128.1	108.9	85.3	100.9	105.9
1965	119.3	102.0	84.0	101.3	98.6
1963	114.4	96.2	88.4	101.1	100.8
1961	111.1	97.8	93.7	100.4	101.4
1959	108.7	101.0	98.1	96.1	100.8
1957	104.7	105.3	102.4	95.9	99.4
1955	100.0	100.0	100.0	100.0	100.0

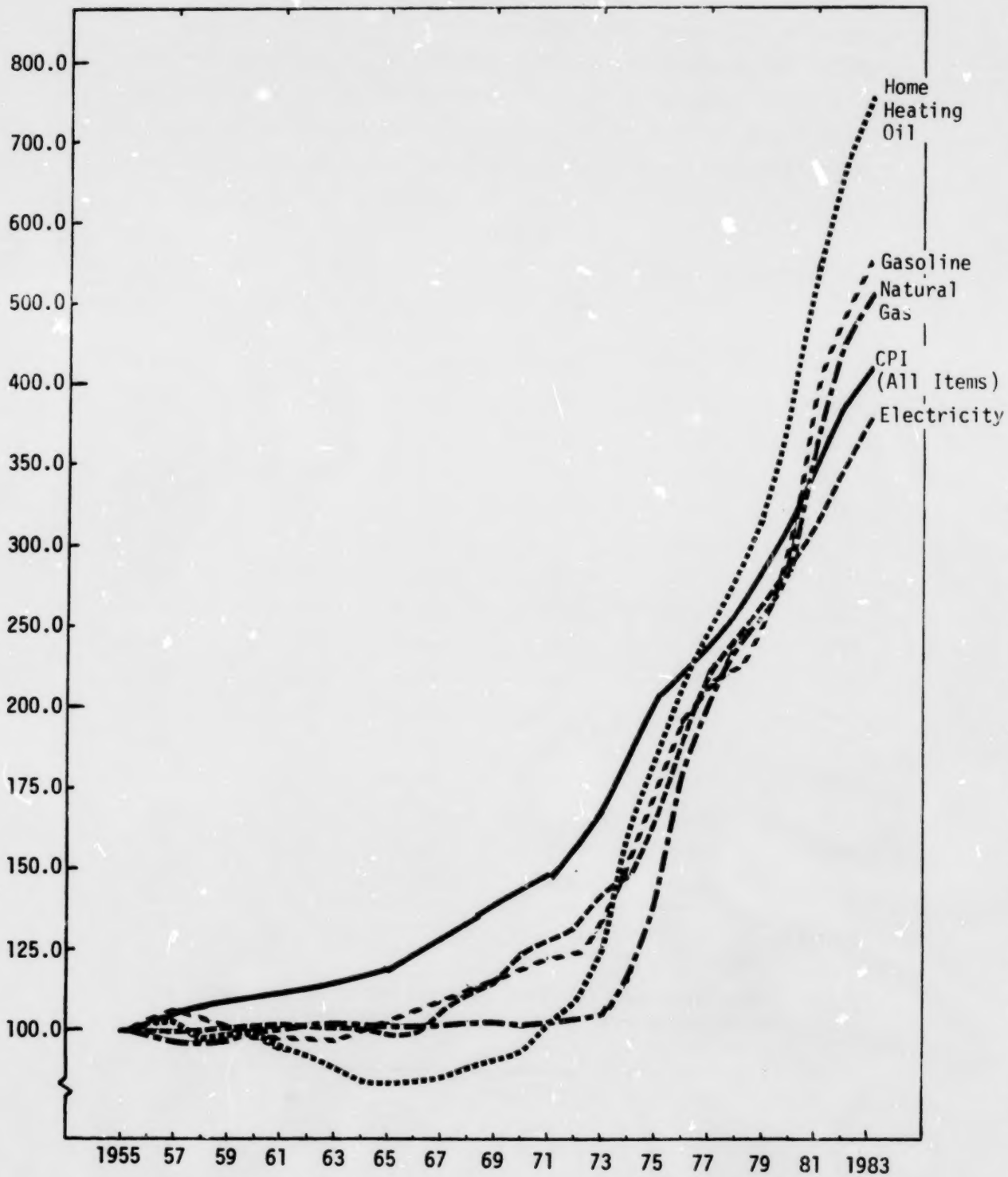
Source: Statistics Canada, Consumer Prices and Price Indexes (62-010) (various years).

*Note: Price increases for 1983 were projected on the basis of increases between March 1982 and March 1983.

4. $7.91 in constant 1971 dollars.

Figure 1

Changes in Energy Prices, 1955 - 1983



Source: Statistics Canada, Consumer Prices and Price Indexes (62-010) (various years).

The Range of Potential Responses to the post 1973 World Energy Environment

The rapid increase in world energy prices, as well as the threat to supplies, posed problems for every national government. Major issues were whether to pass on the entire price increase to consumers and whether to exempt some energy uses, say home heating, from all or part of the price increase. The price increases could be varied between different energy uses, and assistance could be provided to consumers for whom the price increases would constitute a burden. A further problem was to encourage and effect conservation, simultaneously saving consumers energy costs and reducing the need for energy, especially imported energy.

This report focuses on a small number of these problems, most notably those related to distributional issues. It is hypothesized that rising energy prices have different impacts on families and individuals with different incomes. Of particular concern are low income households. This report accepts as a tentative notion that low income households pay a higher proportion of their income for energy, especially for direct energy uses, such as lighting and heating their homes, heating their hot water and commuting to and from work, than more affluent households. It is likewise hypothesized that low income households have fewer means at their disposal to conserve energy and that they may need special assistance to enable them to do so. More affluent households often have the funds required to invest in energy-saving equipment and in insulating and weather-proofing their homes.

The Responsibility of Government

Many nations could not respond in any measurable way to the energy price increases of the 1970s and early 1980s. Price increases

stemming from increases in the well-head price were largely passed on to consumers, although many nations chose to establish policies and programs that ameliorated some of the impact on consumers or on particular groups of consumers, such as the poor. Many western nations did decrease indirect and excise taxes on different energy products, particularly home heating oil and gasoline, to assist consumers in coping with higher energy prices.

The Government of Canada had more choices available, stemming in large part from the fact that Canada is both an oil-producing, as well as an oil-consuming nation. Also, the heavy dependence in many Canadian regions on hydro for electricity production relieved electrical consumers from large price increases.

One response of the Government of Canada to the oil price increases for imported oil, and the fact that residents of eastern Canada were nearly totally dependent on imports for their oil needs, was to extend subsidies to oil importers. Thus eastern oil consumers who had for years seen their tax dollars used to subsidize the production of uneconomic resources in the west finally received some benefits in return.

A second response of the Government of Canada was to adopt a two-tier pricing system for oil. Oil and natural gas sold abroad would be sold at the international price, set largely by the OPEC cartel. Domestic users would pay a lower price. Thus consumers were spared larger price increases and given additional time to adjust to higher prices.

A third response of the Government of Canada to higher oil prices, as well as the provincial governments, was to increase taxes on oil and gas production and distribution. If governments had not

increased their taxes the oil producers, refiners, distributors and retailers would likely have charged the same amount and simply have added it to their profits. Figure 2 shows that the federal government receives over one-third of every gasoline dollar. Another third goes to the provincial governments in the case of domestic oil.

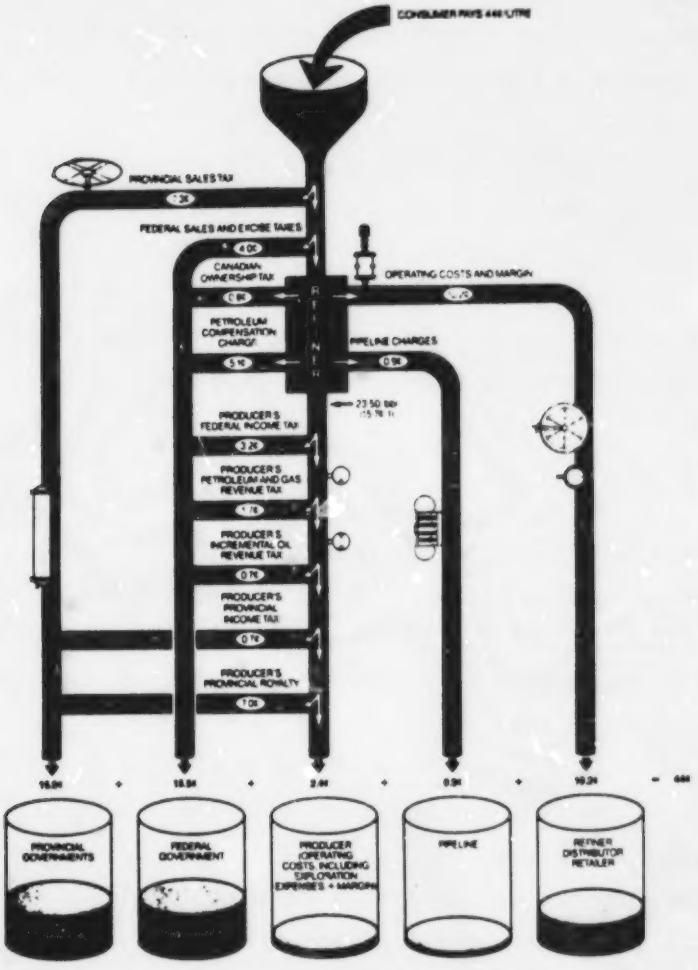
From 1975 to 1980 all levels of government derived almost $29 billion from oil production. Revenues of over $88 billion were projected in 1981 for the 1981 - 1986 period. This estimate is now overly optimistic as a result of the fall in world oil prices that has occurred since the fall of 1982, but no new estimates of expected oil and gas revenues have been published for this time period.

The room for manoeuvrability on the part of Canadian energy and energy-pricing policy, together with the reduction in living standards which a five-fold increase in real energy prices has potentially caused for low income households, makes it essential to consider the impact of rising energy prices on the poor.

The National Energy Program, tabled by the Government of Canada in the fall of 1980, considers the interests of consumers as a group. Consumers benefit from prices that are lower than those paid by consumers elsewhere in the industrialized world, have access to home insulating grants (Canadian Home Insulation Program - CHIP) of up to $500, and have access to matching grants (up to $800) for converting heating equipment from oil to other fuels. These are policies to benefit consumers in general. Low income consumers that rent a home or apartment, cannot normally take advantage of insulation grants. The same is true for fuel oil conversion grants, and even those home owning consumers who are of low income may have difficulty raising their half of the federal fuel conversion grants.

Figure 2

Illustration of Estimated Incidence of
Tax and Sharing of Revenues
(Spring 1982 - ¢/litre gasoline)



Source: Price, Waterhouse and Associates.

And, as will be seen in Chapter 3 below, provincial governments have limited most of their assistance to repayable loans rather than grants.

This report considers the needs of low income households in the light of the impact of rising energy prices on low income households and the current National Energy Program. It has two specific objectives:

1) To set forth as clearly as possible exactly what has been the impact of rising energy prices on low income households, as well as what the future likely holds in this respect; and

2) To consider policy options for ameliorating the impact of rising energy prices on low income households.

Plan of the Report

Chapter 1 contains a review of household spending on energy for the past 30 years, focusing on the past decade in which energy prices have increased nearly five-fold and on low and fixed income households. The focus is on direct energy payments for electricity, water and space heating and gasoline for transportation.

Commonly available data do not allow researchers and policy analysts to estimate energy use by low income households. At least two-thirds of Canada's renters pay for household heat and hot water with their rent. Surveys of family expenditures by Statistics Canada therefore underestimate energy use by low income households.

Their energy expenditures are recorded as part of their rent. A profile of direct energy expenditures of low income households, based on modifications of Statistics Canada surveys of household expenditures, is developed in Chapter 2. This profile is used to project the impact of the higher and rising energy prices projected by Canada's National Energy Program, as well as the impact of a move to world prices. Additional and special attention is devoted to the direct energy expenditures of particular types of households and households in different cities and regions, as the variations are quite large around national averages.

Chapter 3 contains a discussion of such issues as conservation, substitution of renewable energy sources for non-renewable ones, ameliorative assistance required by discrete household types and public policy options. Some existing policies are evaluated from the point of view of their underlying principles and their likely affects on low income Canadians, although a full-fledged program evaluation is not attempted. The report concludes by recommending several specific future policy options.

Chapter 1

A REVIEW OF HOUSEHOLD SPENDING ON ENERGY, 1955 - 1980

The Distributional Impact of Energy Prices

This report focuses specifically on the relationship between income and the price or cost of energy for direct household operations, defined here to include space and water heating, electricity and personal transportation. An assessment of energy costs embedded in purchased goods and services was not undertaken. The longer term impacts of energy prices on low income households as a result of changes in industrial structure, employment and inflation that may ultimately be caused by energy price increases was likewise not undertaken. This report focuses on the pattern of energy expenditures by different income groups. Once such patterns are understood, more sophisticated analyses of the reasons for these patterns can be undertaken, and policies for ameliorating any undesired impacts can be formulated.

Sources for Examining the Relationship Between Income and Direct Energy Expenditures

Attention is directed to the use of empirical data since the primary objective is to determine the extent to which energy costs are regressive across income classes; i.e., the extent to which low income households pay a larger proportion of their income on energy than do high income households.

There has been surprisingly little work undertaken in Canada on the relationship between income and spending on energy. Available sources for undertaking a detailed analysis can be divided

into two general categories: 1) special surveys sponsored by government departments such as the Departments of Energy, Mines and Resources and Consumer and Corporate Affairs and the Canada Mortgage and Housing Corporation;[5] and 2) Statistics Canada's periodic surveys of urban family expenditures. Neither the urban family expenditure survey nor the special surveys have been designed specifically to measure the level of energy expenditures for households of different incomes and types.

Only one of the special surveys of which the author is aware included both transportation and shelter energy expenditures for households of different income groups. This effectively limits the choice of data sources to Statistics Canada's periodic survey of urban family expenditures.

Statistics Canada has undertaken periodic surveys of urban family expenditures on a continuous basis since 1953. Between 1953 and 1978, the date of the last published survey, a total of 13 surveys were undertaken. The primary purpose of the surveys is to obtain the weighting needs for establishing the Consumer Price Index for Canada.

Statistics Canada's 1978 publication, Family Expenditure in Canada, contains the results of a survey of a sample of individuals

5. John H. Chibuk, "Effect of Energy Price Changes on Demand," Ottawa: Working Paper, Economic and Policy Analysis Sector, Department of Energy, Mines and Resources, September 1979, 71 pages; Bertrand Paquet, "Effects of Energy Prices on Redistribution of Income," Canada, Department of Energy, Mines & Resources (Unpublished), 1979; J. E. Stahl, "Differential Income Effects of Federal Oil and Natural Gas Price Policy," Ottawa: Prices Group, Consumer and Corporate Affairs Canada, mimeo, January 1977; Leonard Waverman, "The Two Price System in Energy: Subsidies Forgotten," Canadian Public Policy, Winter 1975, pages 76 - 88.

and families in 16 major urban centres and is one of the largest of the 13 surveys undertaken since 1953.[6] It is also the basis for the current (1981 base) consumer price index.

Methodological Limitations

The chief advantage of using the Statistics Canada series is that it is administered and supervised by professional, experienced surveyors with a wealth of experience in undertaking such surveys. It is a relatively large survey with a sufficient sample size to make generalizations about the Canadian urban population.

The survey also has a number of limitations. The primary limitation is that the energy expenditures of tenants are under-reported, and it is likely that the direct energy expenditures of low-income tenants are under-reported to a greater extent than the expenditure of higher income tenants. Tenants whose utilities and energy use are included in their regular rental payments -- tenants referred to in this report as bulk-metered tenants -- do not report any energy expenditures in the survey for purposes of shelter. Their energy expenditures are included as rent. More than 50 per cent of all households in the lower income categories live in units with bulk-metered heating. Approximately one-third of low income households live in units in which the electricity is bulk-metered, while only about ten per cent of high income tenants are bulk-metered for electricity. Thus, most averaging procedures are strongly biased in the direction of underestimating all energy expenditures and those of low-income households to a dramatically greater extent than those of

---

6. Statistics Canada, Family Expenditure in Canada, 1978 (Ottawa: Statistics Canada, Catalogue no. 62-550, occasional).

high income households. Methods for accommodating these problems are put forward below.

The primary focus of this report is on energy expenditures, income, changes in both and the relationship between energy expenditures and income and changes in that relationship as well. We fully realize that this analysis and these relationships and changes in them reflect at best what might be labelled a "partial" analysis. It is partial because some factors that might compensate consumers in general, or low-income consumers in particular, for increased energy expenditures are not or cannot be taken into account. Some of these factors are increased wages and salaries, decreased inflation for non-energy uses, changes in employment levels, and lower rent increases, especially in rent-controlled apartments.[7] However, this partial analysis is useful for purposes of public policy analysis. It reflects people's actual incomes and their energy expenditures. Individuals and households who establish and review their budgets will perceive these data to be facts, and these facts affect their economic and political behaviour. It would be difficult, and it is probably impossible, to follow through all of these affects. A partial analysis is the best that can currently be done. In focusing on income and energy expenditures and their relationship, the reader should bear this focus in mind, and not assume that the discussion in this report necessarily applies to the overall welfare of individuals.

Two limitations deserve special mention. First, the data from the Statistics Canada surveys excludes for the most part the impact of rising energy prices on rural Canadians. No available

---

7. As of the end of 1983, rents in eight of the ten provinces are regulated in one way or another. Rents in all ten provinces have been regulated at one time or another between 1973 and 1983.

surveys provide a large enough sample of rural Canadians to make conclusions regarding the impact of rising energy prices on them. It can be argued that impacts on rural Canadians are greater than on urban Canadians. Rural Canadians almost never live in apartments or attached houses that use less energy, but on the other hand, they also burn a lot of wood for space heating. Rural Canadians almost always depend on cars for transportation, and they usually put many more kilometers on their cars than urban Canadians. Nevertheless, the recommendations of this report would benefit rural Canadians, as well as urban Canadians.

Secondly, there is suspicion in some quarters that the regulation of rents -- rent controls -- has caused landlords to absorb some of the increases in electricity and space and water heating costs. In every province with rent regulation both energy costs and the costs of increasing the thermal efficiency of dwellings and replacing water and space heating equipment may be legally passed on to tenants over and above the rent review guidelines. The Social Planning Council has recently reviewed tenants' rents and incomes in the Toronto market area.[8] It was concluded that rents during the years 1973 - 1982 increased at about the same rate as tenants' incomes. It was noted that a more or less constant relationship between rents and incomes obtained in the period 1964 - 1975 in which only one province, Quebec, regulated rents. It was also concluded that at least one-quarter of all units in the Toronto market likely received illegal rent increases during 1981 and 1982. One province, Quebec, which contains about 35 per cent of Canada's tenants, does not use a threshold index to regulate rents. Tenants and landlords may negotiate rents. British Columbia, which took final steps to deregulate rents in 1983 and which houses eight per cent of Canada's

8. Social Planning Council of Metropolitan Toronto, Brief to the Commission of Inquiry into Residential Tenancies, February 1983.

tenants had an index well above changes in tenants' incomes for the 1973 - 1983 decade. Alberta deregulated rents in 1978.

A Methodology for Estimating the Incidence of Direct Energy Costs by Income Class

The Statistics Canada series of household expenditure surveys, the latest report from which is entitled Family Expenditure in Canada and was based on 1978 survey data, is the most comprehensive source for estimating direct energy expenditures by income class. Some of the limitations of the type of survey which it represents and this particular survey have been noted above.

The basic formula for summarizing the data is as follows:

Total Household Energy Expenditures = Shelter Related Energy Expenditures + Transportation Related Energy Expenditures

Shelter Energy Expenditures = Oil + Gas Expenditures + Electricity Expenditures

Transportation Energy Expenditures = Gasoline Used for Private Cars + Gasoline Used for Other Vehicles + Energy Embedded in Local and Commuting and Inter-City Travel (non-passenger car)[9]

The main difficulty with using this particular data source, as has been described above, is the inclusion of direct energy expenditures on shelter in rent in the case of bulk-metered tenants. The following procedures were developed to estimate the amount of non-reported direct energy expenditures for bulk-metered tenant households:

---

9. Energy embedded in public transport is assumed to be eight per cent of total expenditures, the average for all transport modes.

1. Average electricity expenditures per household were divided by the percentage reporting electricity expenditures and multiplied by 100. This procedure, also applied by other analysts, in effect assigns the average electrical expenditures per reporting household to the non-reporting ones, implying that on average, bulk-metered units use the same amount of electricity as the owned and individually-metered rental units for each income category. It is assumed that all urban dwelling units have electricity. It is assumed that bulk-metered units use on a per unit basis at least as much electricity for lights and appliances as individually-metered units.

2. Average oil and gas expenditures were added together and adjusted by two factors: one factor adjusted for the percentage of units which were bulk-metered, in effect, developing a factor similar to the one for electricity described above; i.e.,

$$\text{average oil and gas expenditures} \times \frac{(100}{(\%\ \text{bulk metering})}.$$

A second factor was developed to account for the differences between space and water heating needs (and some cooking) of owned, predominantly single detached units and bulk-metered apartments. Based on an examination of Statistics Canada energy expenditure data, classified by owners and tenants, and the experience and judgement of the authors, a factor of 1.3 was assigned to owned stock; i.e., it was assumed that owned units consumed 30 per cent

more oil and gas (per unit) than individually-metered rental units inhabited by households of the same income category. This allows an assessment of the relative energy intensivity of the non-reported stock. Oil and gas expenditures were thus estimated for each income class:[10]

$$O + G \left[1 + \frac{BH}{(1-BH)x(1.3HO+R)} \right]$$

Where O = average oil expenditures per household in sample.

G = average gas expenditures per household in sample.

BH = per cent bulk metering for heating/100.

HO = per cent of units which are owned/100 (assumes 100 per cent of owners report).

R = per cent of reported units which are rented/100 (calculated as 1 - BH - HO).

3. Transportation expenditures are assumed to be accurately reported. However, unlike other analyses, this study includes gasoline for non-passenger car purposes (e.g. motorcycle, pleasure vehicle). Associated or embedded energy expenditures in local commuting is considered. Inter-city travel is also considered and expenditures for this category are added to those for local and commuting and multiplied by .08, the estimate of indirect energy embedded in transportation.

---

10. Although the precise value of this factor is debatable, its general direction and magnitude, as incorporated here, are generally agreed upon. Since the overall results are relatively insensitive to likely variance in values of this factor, the authors felt the application of their own professional judgement was appropriate. An adjustment coefficient for individual versus bulk-metering would also be useful but excessively refined (and difficult to develop) for the preliminary purposes of this report.

4. These various classes of expenditures are summed and presented as a proportion of disposable income for various income classes. Disposable income was selected as a suitable representative of financial resources since it incorporated a consideration of savings which can be used to finance extra energy costs or conservation (unlike the category, total expenditures). At the same time, it excluded taxes (unlike both gross income and total expenditures) which cannot be used to purchase goods and services.[11] Bearing in mind that expenditure data may be more representative of longer term expectations of households, a table comparing energy costs as a proportion of total expenditure and disposable income was prepared. Since the differences were minor (the use of the disposable income measure, will, when compared to the measure of total expenditure, show smaller proportions of household 'resources' spent by households of all income groups, but more dramatically for higher income ones) the disposable income measure has been used throughout.

5. For the sake of completeness, it should be noted that this analysis excludes consideration of the expenditure items, 'other fuels and heating costs' and 'rental of heating equipment' on the grounds that they are relatively insignificant and vaguely defined. They are also as likely to be used for vacation homes as much as principal residences.

---

11. Disposable income for this study was defined as Net Income Before Taxes + Other Money Receipts - Personal Taxes. Income categories to classify households are based on gross annual household income.

Unfortunately, published urban family expenditure data adds together energy expenditures for both a household's principal and vacation residences. The overall number of households owning vacation homes is small (under 8 per cent) and positively correlated with income.[12]

6. Further analysis was also devoted to individually-metered households who purchased gasoline for private car usage. This allows a closer examination of the households for which the Statistics Canada data is directly gathered (i.e. individually-metered ones) and those who use cars. (Data developed by the previously described method allocates transportation energy expenditures across the entire population, not simply those who use cars.)

Household Energy Expenditures

Table 3 and Figure 3 portray total household energy expenditures, as well as the shelter and transportation components, by household income for 1978. Total energy expenditures vary upward from 4.6 per cent of disposable income for households with income of $35,000 and over to 12.0 per cent for households with incomes under $6,000. For car users the range is from 4.8 to 17.0 per cent for the same income groups, while for energy expenditures for shelter

12. For example only 1.3 per cent of households with gross incomes under $4,000 owned vacation homes in 1978, compared to 3.5 per cent for households with $15,000 - $19,999 and 14.9 per cent for those with gross annual incomes of $35,000 and over.

the range is from 2.4 to 10.8 per cent. There is no escaping the conclusion that energy expenditures consume a greater proportion of the income of low income households. Taxes associated with energy use and consumption are therefore regressive taxes.

Table 3

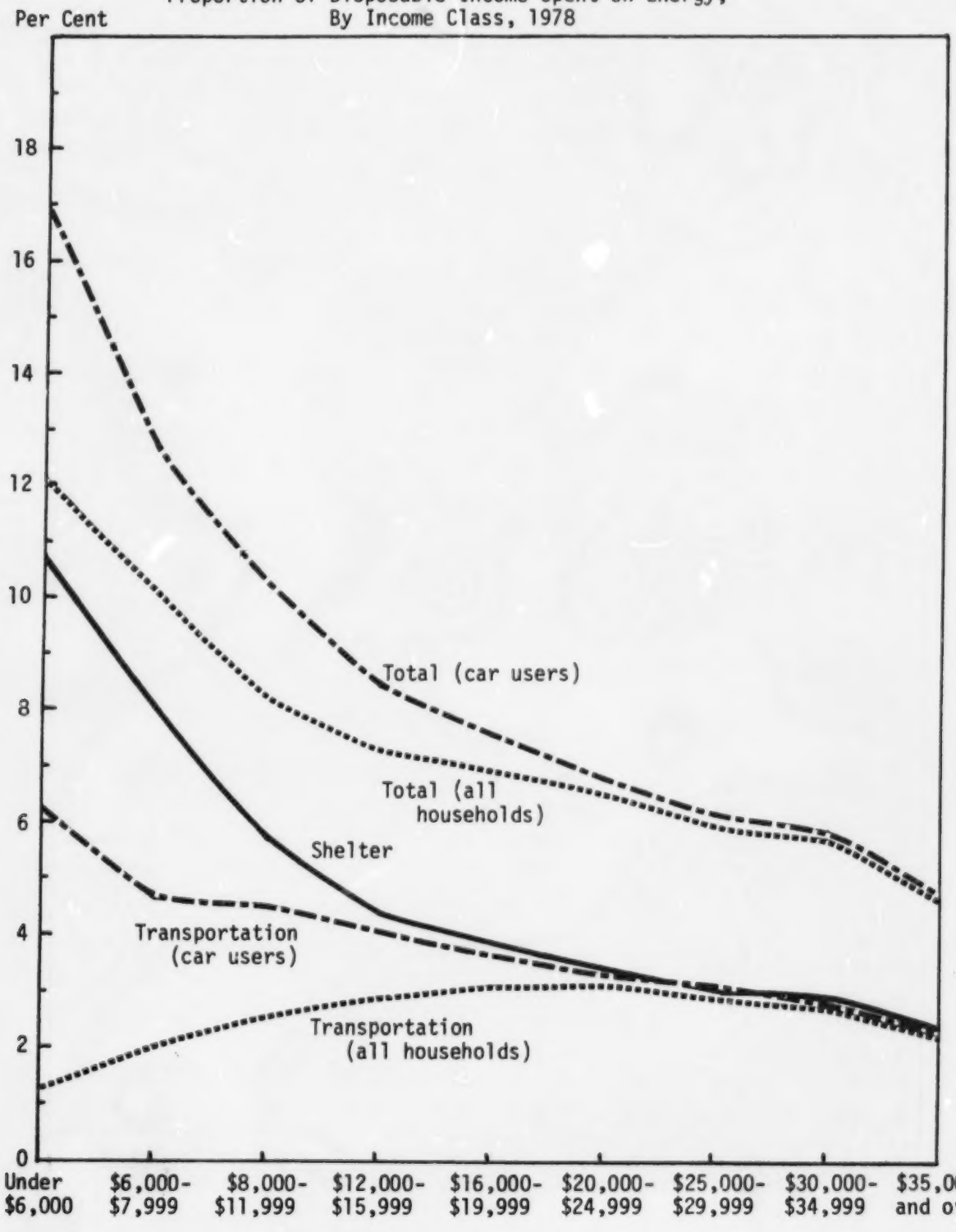
Proportion of Disposable Income Spent on Energy by Income Class, 1978

Income	Per Cent of Sample	Per Cent Disposable Income					Per Cent of Households Reporting Purchase of Gasoline For Private Cars
		Shelter	Transportation (all households)	Transportation (car users only)	Total (all households)	Total (car users only)	
5,999 and Under	9.1	10.8	1.3	6.2	12.0	17.0	17.7
6,000 - 7,999	5.8	8.1	2.0	4.6	10.1	12.7	40.2
8,000 - 11,999	12.7	5.7	2.5	4.5	8.2	10.2	53.6
12,000 - 15,999	12.9	4.4	2.9	4.0	7.3	8.4	69.0
16,000 - 19,999	14.4	3.9	3.1	3.7	6.9	7.5	81.4
20,000 - 24,999	17.0	3.5	3.1	3.3	6.5	6.8	90.9
25,000 - 29,999	11.2	3.0	2.9	3.1	5.9	6.1	92.1
30,000 - 34,999	7.2	3.0	2.7	2.9	5.7	5.9	91.1
35,000+	9.8	2.4	2.2	2.4	4.6	4.8	91.5

Source: Derived from Statistics Canada, Family Expenditure in Canada, Volume 2, catalogue no. 62-550, occasional.

Figure 3

Proportion of Disposable Income Spent on Energy, By Income Class, 1978



Source: Statistics Canada, Family Expenditure in Canada, Volume 2, catalogue no. 62-550, occasional.

Further analysis of the data shows that it is oil and gas expenditures, principally for space heating, that have the greatest amount of regressivity associated with them. Table 4 and Figure 4 portray the proportion of total household energy spending on oil and gas, electricity and transportation. Over 55 per cent of household energy expenditures are for oil and gas for the lowest income groups, while only 28 per cent are for oil and gas for the highest income group. These data allow us to conclude that government policies directed towards either the reduction of energy needs for space heating or the reduced cost of space heating would have the most progressive impact in the sense that they would contribute most towards increasing the living standards of low income households and reducing the regressivity of energy expenditures and energy-related taxes.

Table 4

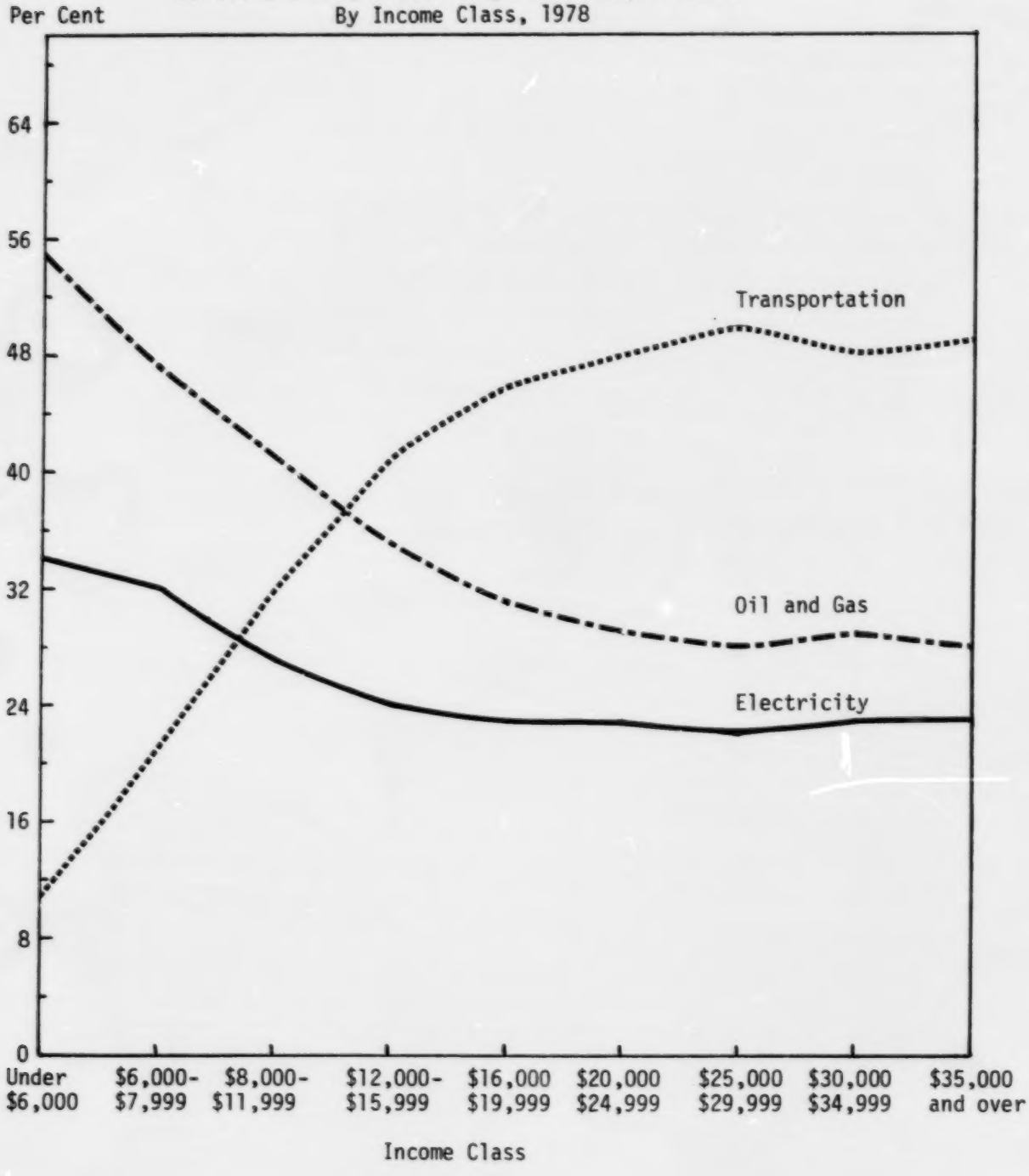
Proportion of Energy Expenditures on
Oil and Gas, Electricity and Transportation
by Income Class, 1978

Income	Per Cent		
	Oil and Gas	Electricity	Transportation
Under $6,000	55	34	11
$6,000 - $7,999	47	32	21
$8,000 - $11,999	41	27	32
$12,000 - $15,999	35	24	41
$16,000 - $19,999	31	23	46
$20,000 - $24,999	29	23	48
$25,000 - $29,999	28	22	50
$30,000 - $34,999	29	23	48
$35,000 and over	28	23	49

Source: Derived from Statistics Canada, Family Expenditure in Canada, 1978, Volume 2, Catalogue No. 62-550, occasional.

Figure 4

Proportion of Energy Expenditures
on Oil and Gas, Electricity and Transportation
By Income Class, 1978



Summary

In this chapter we have adjusted data on direct household energy expenditures reported by Statistics Canada to account for energy expenditures by households not reporting them, but incurring them just the same. Tenants, especially those we have labelled "bulk-metered" tenants, the cost of whose energy consumption is included in their rental payments, were the primary group for whom adjustments had to be made. Such adjustments are especially necessary if the incidence of household energy expenditures by low income households are to be estimated accurately.

It was shown that household energy expenditures, and therefore the federal and provincial taxes included in the consumer cost of household energy, decrease considerably from the lowest income groups to higher income groups as a proportion of household disposable income. That is, energy expenditures are regressive vis-a-vis income levels. The degree of regressivity is even greater in the case of car users. Energy used for space and water heating is the primary reason for the high degree of regressivity.

Chapter 2

THE IMPACT OF CHANGES IN ENERGY PRICES ON DIFFERENT INCOME GROUPS

The preceding data for 1978 portray energy expenditures by various income classes for one point in time. While this picture is a valuable one, our primary interest is changes in energy spending and their impact on different income groups, especially the poor. Individuals and households are theoretically capable of conserving energy and reducing energy consumption in response to rising prices. The evidence, as will be shown below, is that they have succeeded. If those at different income levels were able to reduce their energy consumption by equal proportions, then rising energy prices would not necessarily have a differential impact on different income groups. The effect of rising energy prices on different income groups would not be a problem for public policy.

Below we discuss the extent to which rising energy prices in the period from 1972 to 1978 had a differential impact on different income groups. Average energy prices increased by over 100 per cent from 1972 to 1978. They increased a further 122 per cent from 1978 through 1983.

The relationship between average disposable income and direct energy payments can be seen in Table 5. In 1972 the poorest households spent an average 7.5 per cent of their disposable income for direct energy use in the home. The richest households spent 2.2 per cent of their disposable income for energy use in the home. If gasoline is included, and we direct our attention to car owners, then direct energy payments in 1972 ranged from 12.1 per cent for the lowest income quintile down to 4.6 per cent for the highest quintile.

Table 5

Comparison of the Proportion of Disposable Income Spent on Energy by Individually-Metred Households in 1972 and 1978 (By Quintile and Use of Car)*

Quintile	Average Disposable Income	1978 Oil & Gas**	1978 Electricity	Shelter Energy	Gasoline*** for Users	Gasoline for All	Total - Car Owners	Total - All
1	$6,004.8	5.4%	3.1	8.5	4.0	1.2	12.5	9.7
2	11,443.2	3.0	1.8	4.8	3.8	2.4	8.6	7.2
3	16,148.6	2.3	1.6	3.9	3.4	2.8	7.3	6.7
4	21,332.8	1.9	1.4	3.3	3.1	2.8	6.3	6.1
5	32,420.6	1.5	1.2	2.7	2.5	2.5	5.2	5.2
		1972						
1	3,417.7	4.9	2.5	7.5	4.6	1.0	12.1	8.5
2	6,452.1	2.3	1.8	4.5	3.8	2.0	8.3	6.5
3	8,873.1	2.1	1.4	3.5	3.2	2.6	6.7	6.1
4	11,412.1	1.8	1.2	3.1	3.0	2.7	6.1	5.8
5	17,315.6	1.3	0.9	2.2	2.4	2.2	4.6	4.4

Change, 1972 - 1978

Quintile	Shelter Energy	Gasoline for Users	Gasoline for All	Total - Car Owners	Total - All Households
1	+1.0	-0.6	+0.2	+0.4	+1.2
2	+0.3	0.0	+0.4	+0.3	+0.7
3	+0.4	+0.2	+0.2	+0.6	+0.6
4	+0.2	+0.1	+0.1	+0.3	+0.3
5	+0.5	+0.1	+0.3	+0.6	+0.8

*Assumes households with cars have the same shelter costs and disposable income (for each income class) as households without cars.

**Estimate is based on same procedure described in Chapter 1.

***Estimate is based on dividing gasoline expenditures (for private cars) by the number of persons reporting such expenditures. Other transportation energy related expenditures are relatively minor.

Source: Derived from Statistics Canada, Family Expenditure in Canada, 1978, Volume 2, Catalogue No. 62-550, occasional, and from Urban Family Expenditure, 1972, Catalogue No. 62-541, occasional.

By 1978 and after the initial round of energy price increases in the mid-1970s, the lowest quintile was spending 8.5 per cent of its income for energy in the home, an increase of one per cent over the 1972 amount, while the highest quintile was spending 2.7 per cent of its income for energy in the home, an increase of one-half of a per cent over the 1972 level. The lowest quintile, in addition to spending a much larger proportion of its income on energy in the first place, experienced the largest relative increases in burden between 1972 and 1978.

The increased burden of higher energy payments was actually due to two phenomena. On the one hand, changes in the overall distribution of income were such that the poorest two quintiles had relatively less disposable income in 1978 than in 1972, while the upper three quintiles had relatively more disposable income. The average disposable income of the poorest quintile declined by three per cent from 1972 to 1978, while the average disposable income received by the richest quintile increased by three per cent.[13] The second quintile lost two per cent, and the third and fourth quintiles saw their incomes increase by two and three per cent respectively. Figure 5 portrays changes in average income levels and energy payments from 1972 to 1978. And on the other hand, lower income households were less successful than more affluent households in conserving energy.

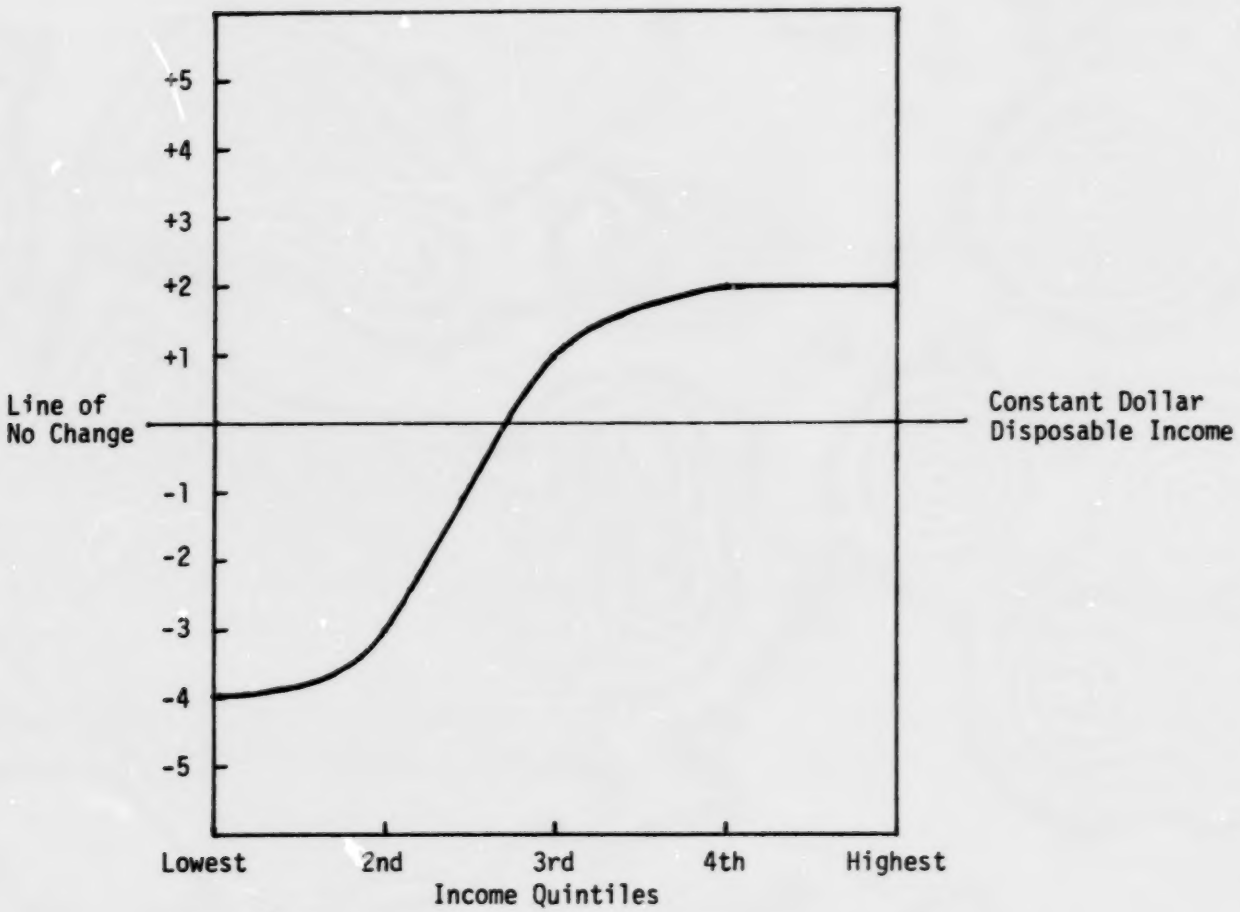
A comparison of direct energy payments in both 1972 and 1978 and changes in energy prices shows that all income groups were consuming less energy in 1978 than in 1972. Conservation was a universal and national phenomenon. However, the means used to

---

13. Statistics Canada, Income Distributions by Size, 1972 and 1978 (Ottawa: Catalogue No. 13-207) Annual changes are expressed in constant dollars.

Figure 5

Per Cent Changes in Disposable Income
After Adjusting for Impact of
Rising Direct Energy Prices
by Income Quintile, 1972 - 1978



Source: Cf. Table 5. Changes in average income by quintile are derived from Statistics Canada, Income Distributions by Size, 1972 and 1978 (Ottawa, Statistics Canada, Catalogue No. 13-207, annual.)

conserve energy varied for different income groups, and these variations in conservation behaviour offer insights into the impact of rising energy prices on low income households.

Table 6 portrays conservation behaviour with respect to home energy use and gasoline by income quintile. Overall, the first, second and fourth income quintiles reduced energy consumption by two per cent. The highest income quintile reduced energy consumption by ten per cent.

Table 6

Changes in Energy Use by Income Quintile, 1972 - 1978 (Per Cent)

Quintile	All Direct Energy Use	Gasoline Car Owners Only	Gasoline for All	Residential Energy
1	-2	-8	+26	-3
2	-2	+6	+27	-12
3	-0.5	+16	+17	-12
4	-2	+16	+16	-14
5	-10	+17	+27	-13

Source: Derived from Statistics Canada, Urban Family Expenditure, 1972 and 1978.

Even more significant is the way energy consumption was reduced. Decreases in energy use in the home ranged between 12 and 14 per cent for the upper four income quintiles. The decline was only three per cent in the case of the lowest quintile. We can only speculate on the causes of this discrepancy in conservation behaviour between the lowest and the upper four income quintiles. The lowest income quintile may not have had the capital or knowledge

to implement conservation measures. Low income renters, especially bulk-metered tenants, may not have had sufficient control over their homes to undertake conservation measures.

A similar discrepancy occurs in the case of gasoline usage. Low income car owners decreased their gasoline consumption by eight per cent. They either drove their cars less or switched to a greater extent to models that consumed less gasoline. The second quintile increased its gasoline consumption by six per cent, while increases in gasoline consumption for the upper three income quintiles were 16 to 17 per cent.

The conservation behaviour of both the lower and uppermost income quintiles has at least one explanation with significant policy implications. The uppermost income quintile conserved energy in the home, but not in the car. This makes sense in light of the fact that home energy prices increased more rapidly than did gasoline prices. Gasoline prices increased by 81 per cent from 1972 to 1978. In the same period home heating oil increased by 159 per cent, natural gas by 134 per cent and electricity by 87 per cent. It therefore made economic sense to conserve more in the home. The lowest income quintile was not able to conserve as much in the home. Consequently, limited income may have forced low income consumers to reduce gasoline usage. Higher incomes and conservation in the home may have contributed to higher gasoline consumption by more affluent households. We stress again that our data are estimated data and that our explanations of conservation behaviour are speculative. It is only an educated guess, but the implication that special attention should be given energy conservation in space and water heating by low income households seems warranted.

Estimated Changes in Energy Expenditures from 1978 to 1983 by Income Class

The data for 1978 and the review of the impact of energy purchases for different income groups provide valuable insights for purposes of making public policy. The 1978 data on family expenditures are the latest published by Statistics Canada, and they are now half a decade out of date. Energy costs increased by 122 per cent between 1978 and 1983, twice as much as the overall increase of 61 per cent in the Canadian consumer price index. The following section contains an estimate of the likely impact of the more recent changes in the price of energy on different income groups.

The following procedures were used to make these estimates. Disposable income from 1978 to 1983 was increased by 61 per cent, the same as the consumer price index. This reflects the fact that there has been little or no growth in real incomes in Canada in this five year period. Statistics Canada estimates that there was a 1.2 per cent increase in real (constant dollars) household income from 1978 to 1981, but that there may have been as much as a 5.5 per cent decrease from 1981 through early 1983. Changes in the real prices by fuel type, 1978 to 1983, were estimated as follows: fuel oil, 106 per cent; natural gas, 48 per cent; electricity, -5 per cent; and gasoline, 83 per cent.[14] Based on a review of the literature, the price elasticity of energy expenditures for home use was estimated at -.5, and the price elasticity of gasoline expenditures was estimated at -.25.[15] For example, the consumption of fuel in the home declined so that one-half of the real price increase was avoided in actual expenditures.

---

14. Based on disaggregated Consumer Price Index data to March 1983.

15. Social Planning Council of Metropolitan Toronto and Michael Miloff, The Impact of Energy Costs on Low Income Households, Appendix 'E', pp.12 - 17.

This procedure, if anything, probably understates the impact of rising energy prices on low income households. Low income households were actually able to conserve less in the 1972 to 1978 period than higher income households, and there is no reason to think otherwise for the more recent 1978 to 1983 period.

Table 7 shows changes in the estimated proportion of disposable income spent on household energy by income quintile. The 1978 - 1983 period saw the burden of high energy costs shift to an even greater extent towards the lowest quintile than was the case in the 1972 - 1978 period. In the 1972 to 1978 period the lowest income quintile had to shift slightly over one per cent of their scarce total disposable income from non-energy to energy purposes. By 1983 this had increased to four per cent. The shift, ranging from 2.4 to 3.2 per cent, for the other four quintiles was significant but still of smaller magnitude.

Regional and Inter-City Variations

The national data used above and some of the conclusions that can be reached from them, however valuable they may be for making policy, also disguise or hide considerable variation in the impact of rising energy prices on low income households. The impact varies significantly from city to city and region to region. For instance, owners of electrically heated homes in St. John's or Halifax reportedly spend upwards to 20 per cent of their disposable income to heat their homes. The contribution of oil import subsidies to electrical generating plants in the Atlantic provinces may reduce the cost of electricity over what it would be without the subsidies, but they cannot eliminate the fact that oil is used to generate nearly half of the electricity generated in the Atlantic provinces,

Table 7

Proportion of Disposable Income Spent on Shelter Energy, and All Household Energy, 1972, 1978 and 1983 (Estimated)

Income Quintile	Shelter	Total
	1983	
Lowest	10.6	12.5
2	5.8	9.7
3	4.8	9.3
4	4.0	8.5
Highest	4.3	7.3
	1978	
Lowest	8.5	9.7
2	4.8	7.2
3	3.9	6.7
4	3.3	6.1
Highest	2.7	5.2
	1972	
Lowest	7.5	8.5
2	4.5	6.5
3	3.5	6.1
4	3.1	5.8
Highest	2.2	4.4
	Change, 1972 - 1983	
Lowest	3.1	4.0
2	1.3	3.2
3	1.3	3.2
4	0.9	2.4
Highest	2.1	2.9

Source: Social Planning Council of Metropolitan Toronto.

but is used for only slightly more than one per cent of electrical generation in the rest of Canada.[16]

Variations in energy costs across regions and between different cities reflect both differences in the prices of energy and differences in the use of energy. Electricity costs, as noted above, vary according to energy source used for generation and the age of the generating plant. While Canadian oil and natural gas policies assure a uniform price across the country, local distribution and transport from the well-head or port of entry still cause a considerable variation in the cost of these commodities to the consumer. The uses of energy may vary even more than price. Space heating needs vary with climate (degree days), the age of the housing stock and so forth. Gasoline expenditures vary with a city's layout and the potential for substituting public transport for private car usage.

When both differences in the price of energy and its use are taken into account, there is considerable variation in energy costs to the consumer across the country. Utility costs (electricity and space and water heating) for the consumer vary from 85 per cent of the national average in Vancouver to 156 per cent in St. John's. Gasoline costs vary from 85 per cent of the national average in Edmonton to 118 per cent in St. John's. Table 8 summarizes these cost factors for the 16 cities included in Statistics Canada's 1978 urban family expenditure survey.

While it cannot necessarily be assumed that these same factors, which are city averages, would apply across all income groups within a city, an illuminating picture of the incidence of

16. Canada, Department of Energy, Mines and Resources, The National Energy Program (Ottawa: 1980), p.106.

Table 8

Average Cost of Energy Used by City, 1978

City	Average Expenditure for those Reporting x Canadian Average	
	Household Utilities	Gasoline
St. John's	1.56	1.18
Charlottetown-Summerside	1.39	0.96
Halifax	1.10	1.00
Saint John	1.28	1.17
Quebec	0.96	1.16
Montreal	0.92	1.07
Ottawa	1.04	0.99
Toronto	1.18	0.98
Thunder Bay	1.27	1.04
Winnipeg	1.06	1.04
Regina	0.99	1.03
Saskatoon	0.83	1.02
Calgary	0.86	0.89
Edmonton	0.86	0.86
Vancouver	0.85	0.90
Canada	1.00	1.00

Source: Statistics Canada, Family Expenditure in Canada, Volume 2, Tables 20 and 21 (Catalogue no. 62-550 occasional).

energy expenditure by income class and by city can be obtained if these factors are applied to different income groups. Table 9 portrays this picture. The range of energy costs relative to household disposable income for the lowest income quintile ranges from a low of 8.3 per cent in Saskatoon to a high of 14.7 per cent in St. John's in 1978. In the case of St. John's it would not be surprising to discover that the 122 per cent increase in energy costs between 1978 and 1983 had pushed the 14.7 per cent for the lowest income quintile up to 19 per cent even after assuming that households in this income quintile were able to avoid half the price increase through conservation and substitution of cheaper energy sources for more expensive ones.[17]

These regional variations reflect that on average households in the Atlantic region paid 24 per cent more for fuel oil and 48 per cent more for electricity than the Canadian average. Tenants paying for their own heat paid 30 per cent more than the Canadian average in the Atlantic region and 12 per cent more in Ontario. They paid less than the Canadian average in Quebec, the Prairies and British Columbia.

Variations in the Relationship Between Energy Costs and Disposable Income by Household Type

There is considerable variation in energy use by different types and sizes of households. Average household size in Canada is about 2.75 persons. Average household size in the lowest income quintile is about 1.66. The average age of heads of households in Canada is about 45 years. It is 55 years for households in the lowest

---

17. Assumes that the relationship of costs in each city to national costs is the same for 1983 as for 1978.

Table 9

Average Energy Expenditures as
Per Cent of Disposable Income
by Income Group and by City, 1978

City	Income Quintile Groups				
	1	2	3	4	5
St. John's	14.68	10.32	9.38	8.45	7.16
Charlottetown-Summerside	12.97	8.97	8.11	7.28	6.15
Halifax	10.55	7.68	7.09	6.43	5.47
Saint John	12.28	8.95	8.27	7.50	6.39
Quebec	9.55	7.39	6.99	6.42	5.49
Montreal	9.10	6.99	6.59	6.04	5.16
Ottawa	10.03	7.37	6.83	6.20	5.29
Toronto	11.21	8.01	7.34	6.63	5.64
Thunder Bay	12.05	8.60	7.86	7.10	6.03
Winnipeg	10.26	7.59	7.04	6.41	5.46
Regina	9.66	7.22	6.74	6.15	5.25
Saskatoon	8.28	6.43	6.10	5.60	4.79
Calgary	8.38	6.27	5.84	5.33	4.55
Edmonton	8.34	6.19	5.76	5.25	4.47
Vancouver	8.31	6.24	5.84	5.33	4.55

Source: Social Planning Council of Metropolitan Toronto. Derived by multiplying city energy price factors in Table 8 by incidence of energy prices by income quintile shown in Table 5.

income quintile. How much do larger than average households pay for energy relative to the average household? How much do the elderly pay for household energy? In both cases the evidence is not unexpectedly that they pay more than average households for their energy.[18]

Table 10 shows that the cost of energy for shelter in 1978 ranged from 2.8 per cent of disposable income for the highest income families to 6.4 per cent for the lowest quintile.[19] Elderly couples in the same income group paid a smaller share of their income for energy in the upper three income quintiles, but a higher proportion in the lower two income quintiles. Further disaggregation of these elderly couples by regions showed that the cost of energy for the lowest income quintile ranged from a low of 8.5 per cent in British Columbia to a high of 12.7 per cent in the Atlantic region. Projection of the latter figure to 1983 for St. John's would result in 22.2 per cent of disposable income for shelter energy alone.

Why do the elderly consume so much more energy than the non-elderly? The elderly are more susceptible to colds and respiratory infections and may thus require warmer houses and greater amounts of energy. The elderly tend to live in older houses, which are often less well insulated. In addition, since the elderly have lower incomes than the Canadian average for each of the five income quintiles, the percentages would be higher even if the elderly consumed the same amount of energy as average households.

---

18. The data in this section were generated by special tabulations by Canada Mortgage and Housing Corporation on the Statistics Canada 1978 urban family expenditure survey. These data were run on household energy use only, and do not include energy use for transportation.

19. Families of 2 or more persons.

Table 10

Shelter Energy Expenditures by
Larger and Older Households
Reporting Energy Purchases, 1978

	Income Quintile (Per Cent of Disposable Income)				
	1 Lowest	2	3	4	5 Highest
All Families of 2 or More	6.4	4.4	3.9	3.4	2.8
Elderly Couples	7.0	4.6	3.8	3.2	1.9
Home Owners					
Atlantic	12.7	8.3	5.8	4.5	n.c.**
Quebec	9.6	6.5	6.9	2.8	n.c.
Ontario	10.6	5.6	5.1	3.0	n.c.
Prairies	10.5	5.0	3.8	2.6	n.c.
British Columbia	8.5	5.0	---*	4.0	n.c.
4 Person Families***					
Home Owners					
Atlantic	10.0	6.7	6.4	3.7	n.c.
Quebec	7.4	6.0	4.9	3.8	n.c.
Ontario	10.2	6.9	4.9	4.2	n.c.
Prairies	8.5	5.8	4.5	3.6	n.c.
British Columbia	12.1	5.3	4.8	3.8	n.c.

*Sample too small to calculate.

**Not calculated.

***Husband and wife, married and living together and 2 children under 18 years.

Source: Special tabulations, 1978 Family Expenditure Survey.

Larger families, defined here as the "typical" family of a mother, father and two children under 18 years, also consumed more energy than "average" households of 2.75 people. Expenditures for the lowest income quintile larger family homeowners ranged from a low of 7.4 per cent in Quebec to a high of 12.1 per cent in British

Columbia. Again, the proportion in St. John's for 1983 could easily be 17 per cent. Larger families usually occupy more space than smaller families, and this fact may be the simplest explanation of the differences in energy payments between larger and smaller households.

Summary

This chapter has provided an overview of the impact of rising energy prices on low income households. Whether one focuses on the static picture, the absolute proportion of income spent on shelter and direct household energy use, or on the changes resulting from the first oil price shock in 1973 and 1974, the magnitude of the impact of rising energy prices on low income households has been profound. Most Canadian households have had to dip into their household budgets to find two to three per cent to re-allocate towards household energy expenditures. The lowest income fifth of our population have had to re-allocate from a much smaller base.

The data show that most of the impact of rising energy prices on the poor occurs as a result of household space and water heating needs, especially where oil and gas are used. Thus, any amelioration of the impact of rising energy prices on low income households will be by either facilitating energy conservation in the home, by increasing the incomes of the poor, or by compensating the poor for their proportionally higher energy costs.

We have also examined the considerable regional and household type variations focusing, in the latter case, on the elderly and on larger families. The data show that energy spending likely increases with the age and size of the household. When this fact is

added to the considerable regional variation, notably the high costs of over 1.5 times the Canadian average in St. John's, it can be concluded that in 1983 there are considerable numbers of Canadian households paying a fifth of their incomes for household energy. It is this fact that constitutes the problem of rising energy costs and the poor.

Chapter 3

THE POLICY ISSUES AND POLICY RECOMMENDATIONS

It is clear that low income households pay, and are just as likely to pay in the future, high proportions of their income for energy. The available data indicate that the impact of rising energy prices has been felt disproportionately by low income households.

An increase in the cost of energy affects consumers in the same way as a cost increase in any other single good or service. It reduces income available for the consumption of other goods and services. It would be both difficult and undesirable to develop policies and programs to deal with every increase in the cost of a good or service. High energy prices no doubt go further than any programs or policies in motivating Canadians to conserve energy. A plausible case can be made for treating increases in the prices of energy commodities differently than increases in the prices of other goods or services, however, since energy is a very large component in the budgets of poor Canadians. The large proportion of energy costs comprised of provincial or federal taxes also provides a rationale for giving special consideration to energy costs rather than to the costs of many other goods and services.

The Best Policy Would Be An Incomes Policy

Many experts believe that the best policy that could be formulated to ameliorate the effects of price increases in commodities basic to human welfare, such as energy for home use, would be an incomes policy such as a guaranteed annual income or a negative income tax. The community would establish an income floor sufficient to cover the acquisition of goods and services to live a decent life.

Canadians have up until now been unwilling to adopt such policies except in the case of low-income pensioners, and even then the level of assistance is below the level that the Government of Canada recognizes as the poverty line.[20]

Why Develop Specific Programs for Poor Canadians?

The following, without rejecting the option of providing minimum adequate incomes to all Canadians, identifies several reasons for developing policies specifically aimed at mitigating the negative effects of rising energy prices on low income households:

1. It is unrealistic to expect the development in the short-term of a comprehensive integrated incomes policy in Canada.

2. While most social assistance and incomes policies already consider energy in establishing the total assistance amount, energy costs vary substantially between different low-income households, and energy price increases over the past decade have been substantially above increases in income transfer amounts.

---

20. In 1980 the median income of unattached elderly individuals, about half of whom received the Guaranteed Income Supplement, the federal government's guaranteed annual income for elderly Canadians, was $5,684 annually, while Statistics Canada's low-income cut-off for urban areas larger than 500,000 population was $7,152. Over 61 per cent of unattached elderly individuals and nearly 14 per cent of elderly couples had incomes below this poverty line. Cf. Statistics Canada, Income Distributions by Size, 1981, Catalogue No. 13-207, annual, Appendix.

3. The direct household consumption of energy is used for the most part for basic services - space and water heating, cooking, refrigeration, lighting and travel to and from work, shopping and so forth.

4. Low-income households often have relatively fewer opportunities than other groups to reduce consumption. Proportionately more of them live in bulk-metered units, do not own a car and already rely exclusively on public transportation. They own merely basic appliances, have net financial liabilities and poor access to capital, and do not own recreational vehicles or houses. Figure 6 illustrates some of these patterns.

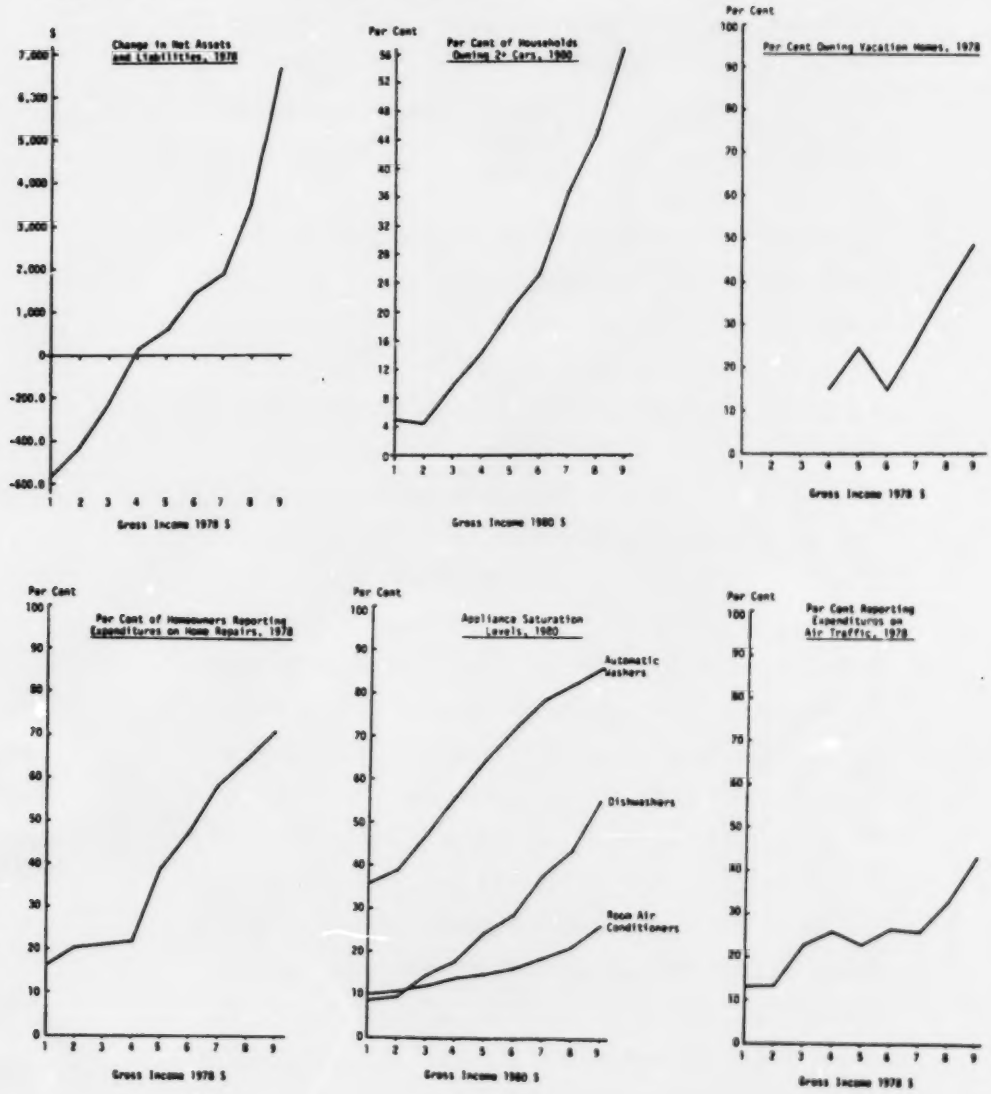
5. The conservation of energy, particularly to the extent that it would contribute to the achievement of national self-sufficiency in oil, is a national priority. The achievement of the objective of national self-sufficiency in oil by the year 1990, the objective of the current National Energy Program, depends on bringing new frontier oil resources into production, and the recent decline in oil prices makes this occurrence less and less likely.[21] Conservation is therefore more and more a national priority, as it is the only way to reach self-sufficiency. Although it is conservation by high energy users

---

21. Edward A. Carmichael and James L. Stewart, Lessons from the National Energy Program (Montreal: C. D. Howe Institute, May 1983).

Figure 6

Comparison of Selected Energy-Related Variables, 1978 and 1980


$
Change in Net Assets and Liabilities, 1978
Gross Income 1978 $
Per Cent
Per Cent of Households Owning 2+ Cars, 1980
Gross Income 1980 $
Per Cent
Per Cent Owning Vacation Homes, 1978
Gross Income 1978 $
Per Cent
Per Cent of Homeowners Reporting Expenditures on Home Repairs, 1978
Gross Income 1978 $
Per Cent
Appliance Saturation Levels, 1980
Automatic Washers
Dishwashers
Room Air Conditioners
Gross Income 1980 $
Per Cent
Per Cent Reporting Expenditures on Air Traffic, 1978
Gross Income 1978 $

INCOME KEY

1. $5,999 and Under
2. $6,000 - $7,999
3. $8,000 - $11,999
4. $12,000 - $15,999
5. $16,000 - $19,999
6. $20,000 - $24,999
7. $25,000 - $29,999
8. $30,000 - $34,999
9. $35,000+

Source: Statistics Canada, Family Expenditure in Canada, 1978, Vol. 2, Catalogue no. 62-550 (occasional); Statistics Canada, Household Facilities by Income and Other Characteristics, 1980, Catalogue no. 13-567 (occasional).

and more affluent Canadians that will contribute most to the self-sufficiency objective, assisting low-income households may result in energy conservation that would not otherwise occur.

A Note on the Recent Stability of Energy Prices

Energy prices increased at twice the rate of all items in the Consumer Price Index between 1973 and 1983. Increased prices were set in motion and then sustained by the actions of the OPEC oil cartel. Between October 1973 and December 1982 there was a ten-fold increase in the well-head price established by OPEC countries. This became the "world price." Oil prices peaked in the fall of 1982. They have since declined by a fifth or more. A combination of factors led to this decline, including reduced aggregate demand in the consuming countries, increases in production in non-OPEC countries (principally, Norway and the United Kingdom, Mexico, the United States and Canada), and increases in production in OPEC countries, leading some countries to undercut the officially sanctioned OPEC price. Together these trends have undermined the cartel, at least in the short term.

Many observers therefore expect oil prices, at least in real constant dollar terms, to remain stable to the end of the 1980s.[22] The question is posed, why establish policies or programs to ameliorate the impact of rising energy prices when prices are no longer rising? The best answer to give to this question is that the evidence is that the price increases experienced in the decade 1973 - 1983 have already had a proportionately severe impact on poor

22. Cf. The Economist, 286.7274 (January 29, 1983), pp.11, 47 and 57 - 60.

Canadians. The breathing space from rapid price increases that we may be experiencing gives the nation time to adopt and implement new policies and programs.

It should also be borne in mind that Canadian price movements in energy will not be as sluggish as international ones. Just as Canadian domestic prices never increased as far or as rapidly as international ones, it is not anticipated under the current National Energy Program that Canadian price increases will slow down as fast as international ones.

Policy Principles

Four broad principles are tentatively proposed as guidelines for incorporating a concern for low income households into energy and energy conservation policies. These principles can be applied either to devising policies specifically to help low income households cope with high energy costs or to evaluating energy and energy conservation policies on the basis of their distributional impacts. These principles can be stated as follows:

- Energy policies should be sensitive to those households whose financial and material well-being is most threatened by energy costs and rising prices;

- Energy policies should be sensitive to those households who have the least opportunity for reducing consumption through behavioural or technological means;

- To be consistent with other policies, energy policies directly aimed at assisting households in 'need' should encourage the conservation of energy and substitution of renewable for conventional energy forms; and

- Energy policies aimed at assisting households in need should be integrated into existing policies/programs rather than be the subject of separate administrative institutions.

Low Income Target Groups

Although there are many different ways of defining which households are of low income, the derivation of energy expenditure date on an income quintile basis in this report, as well as the markedly higher proportion of disposable income paid by the lowest (poorest) income quintile for energy, makes it simple and easy to designate this lowest income quintile as the group on which to focus the discussion of energy policies for low income households. Table 11 presents selected socio-economic characteristics of the five income quintiles for 1978.

Households in the lowest income quintile are much smaller than average (1.7 persons compared to an average of 2.8 persons and 3.6 persons in the highest income quintile), have much higher proportions of senior citizens and far lower proportions of full-time wage and salary earners. Only 27.8 per cent of the lowest income quintile households are homeowners, compared to 83.4 per cent for the highest quintile, and only 31.4 per cent of the lowest income quintile households own cars or trucks, compared to 72.3 per cent of all households and 91 per cent of households in the highest income quintile.

Table 11

Characteristics of Income Quintiles, 1978*

	All Classes	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Family size	2.75	1.66	2.24	3.00	3.28	3.58
Persons 18 - 64	1.79	.78	1.53	1.91	2.17	2.54
Persons 65+	.23	.61	.21	.14	.09	.08
Persons Under 18	.80	.30	.59	1.00	1.08	1.03
No. of Full-Time Earners (Persons)	.89	.14	.67	.94	1.24	1.46
Age of Head	45.0	55.1	43.0	41.8	40.6	44.5
Income Before Taxes	$21,175	$6,276.9	$13,083.0	$19,147.2	$26,070.4	$41,298.2
% Homeowners	51.9	27.9	29.5	53.0	65.9	83.4
% Car Owners	72.3	31.5	64.3	83.5	91.2	91.0

*These data are derived from Statistics Canada, Urban Family Expenditure, 1978, 62-547 and therefore correspond to the data used to generate estimates of energy expenditures on a quintile basis.

Existing Energy Policies and Programs for Low Income Households

A number of federal and provincial programs and policies have been implemented in the past five years to assist low income households in adjusting to higher energy prices and in conserving energy, especially for space heating.

The federal government has four main consumer programs which are described briefly below.

The Canadian Home Insulation Program:

The Government of Canada's Home Insulation Program has been in operation since late 1977 in eight of the ten provinces. It provides taxable grants of up to $500, including both labour and materials, for any home owner, landlord or tenant for retrofitting existing residential structures with insulation. A previous program existed in Nova Scotia and Prince Edward Island.

To April 1983 more than 1.8 million households, 20 per cent of Canada's total, had received grants totalling over $700 million. Approximately one-third of the grants were for houses built prior to 1945. Over 85 per cent of the structures for which grants have been awarded have been single-detached houses, while only about 2 per cent have been for apartments. Only 5 per cent of the grants have been received by landlords or tenants.

Most of the grants have resulted in considerably higher thermal resistance values. Average initial RSI values of .48 in ceilings have been increased to 3.08, while initial RSI values of .26 in walls have been increased to 1.73. In both these cases the new thermal resistance factor is still considerably less than recommended values.

The program's greatest penetration has been in New Brunswick while Ontario also has received proportionately more grants than its share of the population. Quebec residents have received the fewest grants, probably due to a low level of home ownership.

Because grants are taxed by Revenue Canada, net dollars received decline as income increases. Unfortunately, no data are available on the income characteristics of the recipients, although

the fact that grants have not been received by many tenants or landlords is at least partial evidence that an important component of the low income population has not benefitted to a great extent.

Residential Rehabilitation Assistance Program (RRAP):

Since 1973, some units in designated areas in Canada have benefitted from Residential Rehabilitation Assistance Program which currently provides grants of up to $3,750.

Although most units are reinsulated to higher levels than they previously possessed, energy conservation objectives are not explicitly incorporated in the standards to which homes must be rehabilitated. The program is clearly income related, however, and could be easily modified to include additional provisions for energy conservation.

To the end of 1981 some 175,000 homes, about 60 per cent in urban areas and 40 per cent in rural areas, had received over a billion dollars in low-interest loans from the Canada Mortgage and Housing Corporation, about half of which became outright grants. The low income limit has meant that beneficiaries have definitely been of low income, and a large number have been elderly home owners. In 1981 the average age of recipients was 58 years in urban areas and 52 years in rural areas, and the average household income was only slightly above $10,000.

Canadian Oil Substitution Program (COSP):

The federal government will match consumers' expenditures on conversion equipment with a taxable grant up to $800 for changing

from oil.[23] Such conversion in many parts of Canada would enable a household to maintain constant space heating expenditures in the 1980 - 1984 period. The fact that it is a taxable grant means that assistance declines as income increases as in the case of grants under the CHIP program. Over 500,000 households had received grants up to April 1983.

New Residential Construction Standards:

In response to the need to improve the energy efficiency of new residential construction, the thermal resistance guidelines of the National Building Code have been increased in recent years. The Code itself, however, is not mandatory except for housing financed by Canada Mortgage and Housing Corporation or under the National Housing Act. Construction standards fall within provincial jurisdiction, are not usually mandatory, and are usually enforced by municipalities.

Regardless of whether or not the National Code is mandatory in a particular situation, there is little incentive for owners or builders to exceed the recommended standards. Few Canadian municipalities have design and siting guidelines to take maximum advantage of passive solar heating potentials, although some sub-divisions meeting such standards have been planned in a few municipalities across the country.

The encouragement of developers and municipalities in developing energy conserving housing is clearly an important and

---

23. Residents of Newfoundland and Prince Edward Island to whom gas is not available may use the grant for more efficient oil-burning equipment.

necessary element of an overall strategy to reduce energy consumption in new residential construction. Raising mortgage ceilings in the case of social housing, gearing subsidies and providing technical assistance to producers/residents of energy efficient housing, would contribute to significant energy savings in new residential units. However, given the few low income households who purchase new housing, medium and high income home buyers would gain most of the benefits from such programs. The application of energy-efficient standards and policies to government assisted housing, including permitting high thermal resistant social housing units to exceed C.M.H.C's maximum unit price guidelines, however, would aid some low income households.

Provincial Programs

All but two provincial governments have programs of their own to assist home owners, and in some cases tenant occupants, in improving the thermal efficiency of their homes and for acquiring more efficient space or water heating equipment. Table 12 summarizes the general features of these programs. Every province except Alberta provides loans to consumers, usually at rates equal to, or even slightly lower than, the provincial utility or agency long-term borrowing rate. Loan amounts range from $500 in British Columbia up to $3,000 for Quebec. Provincial utilities more often than not administer the programs. In two provinces beneficiaries are also required to take advantage of the federal CHIP program. Since the termination of Quebec's program for matching the federal grant in 1981, only Alberta, which limits its program to elderly home owners, provides grants, as well as loans. New Brunswick and the western provinces limit their programs to home owners. Only Nova Scotia and Quebec offer loans to landlords of bulk-metered buildings. The

primary value of the provincial programs appears to be in the provision of consumer loans. Those home owners, tenants or landlords lacking capital, but with sufficient income to pay back the loans in a short period of time, are the primary beneficiaries.

The only other provincial program of note was the Ontario Energy Tax Credit, which expired at the end of 1983.

Table 12

Summary of
Provincial Energy Conservation Programs

	Loan for Insulation	Loan for Equipment	Grant	Integrated with CHIP	Other
Nova Scotia	$2,500	$3,000	No	Yes	
New Brunswick	$1,000		No	No	
Quebec	-	$3,000 -	Ended in 1981	Yes	
Ontario	- $2,000 - plus Ontario Home Renewal Program		No Income Related	No	Energy Tax Credit
Manitoba	-	$1,000 -	No	No	
Saskatchewan	-	$1,000 -	No	No	
Alberta	No	No	$1,000 - $2,000 for elderly home owners	No	
British Columbia	-	$500 -	No	No	

Several provincial governments have in recent years suspended the collection of sales taxes on insulation materials, storm windows/doors, and machinery equipment and materials aimed at taking advantage of renewable energy. None of these programs have income-related features. In the case of the more sophisticated technologies used mainly by higher income markets, the suspension of sales tax collection might be expected to have a regressive impact, although it would assist in meeting national conservation objectives.

Policy Discussion

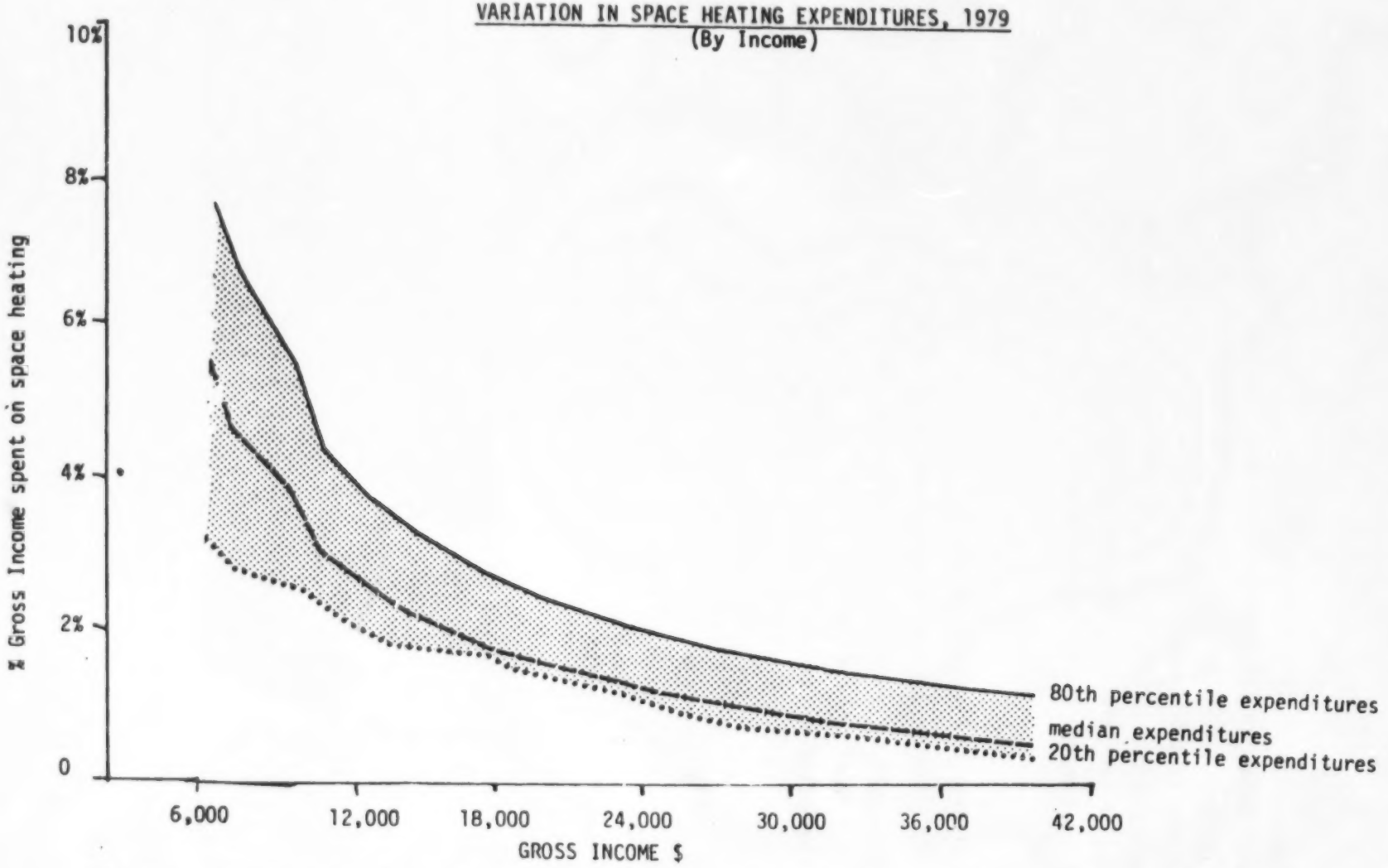
Several low income groups are particularly disadvantaged by energy prices. Senior citizens who live in energy inefficient housing, large low-income families, low-income families with earners who require a car for commuting, tenants, particularly those with bulk-metered heating, households who use oil for heating, and households requiring special energy-intensive appliances or transportation services, all pay a much greater proportion of their income for direct energy purchases than other groups. In addition they have seen their energy bills increase disproportionately over the 1973 - 1983 decade, and have often been hampered in their conservation efforts by the lack of savings or capital.

The energy expenditure data provided in this report are averages, even where the expenditures of relatively discrete groups are reviewed, and therefore represent a range of actual expenditures. Figure 7 provides data from a 1977 survey by M. Berkowitz showing ranges of space heating expenditure levels as a proportion of total income for the 20th and 80th percentiles of all income groups.[24]

24. M. Berkowitz, Implementing Solar Energy Technology in Canada: The Costs, Benefits and Role of Government (Ottawa: Government of Canada, Department of Energy, Mines and Resources, 1977).

FIGURE 7

VARIATION IN SPACE HEATING EXPENDITURES, 1979
(By Income)



Source: M. Berkowitz, Implementing Solar Energy Technology in Canada: The Costs, Benefits and Role of Government (Ottawa: Government of Canada, Department of Energy, Mines and Resources, 1977).

These data indicate a considerable variation in expenditures, in particular for low income households. The data indicate the need for ameliorative programs to be quite specific with respect to target groups and their characteristics. Otherwise, a given program, while it may be sensitive to the needs of low income households, may not be sensitive to those low income households with the highest direct energy expenditures relative to income.

Criteria to Assess Policies

In order to formulate ameliorative policies, it is necessary to develop a set of evaluative criteria. Following is a listing of key considerations which should be used in developing and evaluating policy in this area.

- Definition of Hardship and Need
- Coverage
  - number of households assisted
  - scope and type of households assisted (extent to which program includes those in need and excludes those not in need)
- Savings
  - financial savings per household
  - national financial savings
  - national energy conservation (by fuel type and region)
- Costs of Program
  - total $
  - per $ of energy/financial savings

- Feasibility of Program
  - public acceptance
  - administrative
  - jurisdictional

The Pluses and Minuses of Various Energy Policies from the Point of View of Low Income Consumers

Subsidies to low income and other households can be provided in a variety of ways:

- subsidy of energy prices faced by all consumers;
- fixed grants to low income and other households;
- subsidies to low income households such that their expenditures on energy would be reduced to a proportion of disposable income similar to that spent by households of other income levels (e.g. median or high income groups);
- subsidies which cover a given percentage (including 100 per cent) of household energy costs associated with future energy prices; and
- subsidies which cover the proportion of energy costs (up to 100 per cent) required to ensure that low income households have a decent level of financial and material well being.[25]

The benefits from general consumer subsidies are definitely regressive because the amount of energy consumed increases with income. Higher income consumers receive a higher subsidy than low income consumers. Whether the overall affect of programs is neutral or

---

25. This principle would require the establishment of a poverty line level indicating an acceptable level of household income after payments for energy had been made.

regressive depends on the nature of the taxes paid to government to fund the programs. If it is assumed that the tax system is progressive, that taxes increase as a proportion of income as income increases, then it may be concluded that a program which subsidized energy consumption in general was neutral in its overall incidence. The assumption that the tax system is neutral, that taxes as a proportion of income are more or less constant across all income groups, an assumption for which there is increasing empirical evidence, might lead to the conclusion that such a program was regressive in its overall incidence.

With respect to the particular policy included in the National Energy Program of 1980 whereby an excise tax on oil and gas production is used to pay for subsidizing oil costs to eastern Canadians, there is considerable evidence that the program is regressive in its overall incidence. The excise tax itself is regressive because energy costs, and therefore taxes on energy, decline as a proportion of income as income increases. On the other hand, the benefits increase as income increases because energy consumption increases as income increases.

A subsidy which granted a fixed sum to all households of a given class, say families with incomes below $20,000, would be progressive in that it would represent a greater proportion of low income household energy expenditures and income than that of medium and high income households, but would, of course, suffer from a general insensitivity to individual household needs.

In principle, the ideal subsidy would compensate low income households to the extent that energy expenditures were a burden on their household budgets (for instance, as measured by the

proportion of income spent on energy). There is a major disadvantage of such a subsidy, and that is the possibility that excess energy consumption may be encouraged.

Many of these difficulties could be overcome if subsidies were geared to specific types of target households regardless of their precise level of expenditures. Such a program could provide subsidies to households according to categories by which households can be easily identified, for example, through income level, age of household head, region, household size, and so forth. Although such an approach would reward many households who do not pay high proportions of their income for energy and exclude some who do pay high proportions of their income for energy, it would be administratively manageable.[26]

A program directed to reducing the average proportion of income spent by households in the lowest income quintile to that of quintile 3 would provide a subsidy of approximately $274 per household and would cost about $400,000,000 in subsidies.[27]

A program devised to compensate households in Quintile 1 for 80 per cent of energy price increases from 1979 to 1985, households of Quintile 2 for 40 per cent and households of Quintile 3 for 20 per cent would provide savings per household of $335, $250 and $160 and would cost a total of $530,000,000, $390,000,000 and

---

26. The defeated federal Budget of December 1979 in fact made such a proposal in proposing energy rebates for households according to levels of income and numbers of children.

27. 1983 dollars.

$255,000,000 for Quintiles 1, 2 and 3 respectively and total nearly $1.2 billion.[28]

The ideal policy would be to provide grants to low income households to encourage them to conserve energy and thus simultaneously reduce annual household costs and contribute to national goals of energy conservation. If the savings to low income households stemming from such programs exceeded the remaining costs, a high motivation would exist for households to take advantage of the grants.

A central public policy issue is how to resolve trade-offs among energy conservation goals, economically acceptable payback periods and equity goals. Although a given grant may cover a higher proportion of a low income compared to a high income household's expenditures on conservation, it is not clear that such a grant, in fact, will lead to a greater reduction of energy consumption. Indeed, the high income household's greater access to capital, ability and willingness to use longer payback periods and potentially larger scale investment, is more likely to lead to greater energy and financial savings.

Low income households typically have a lesser cash flow, less capital and less access to it than high income households. The mechanism of delivering incentives needs to be sensitive to this issue. Grants covering conservation expenditures by low income

---

28. The federal budget of December 1979, which was never implemented, would have provided subsidies of $220 per family consisting of two adults and two children with household income of $21,380 and below in 1980.

households could be provided before rather than after the conservation action has been undertaken.[29]

As well, most low income households are tenants (many living in bulk-metered units) and therefore only could benefit from conservation incentives if their landlords were to participate in such a program.[30] Bulk-metered apartments present an additional set of problems as it is more difficult (compared to individually-metered units) to ensure that savings are passed on to the tenants. Many have suggested that since bulk-metering encourages excess consumption (as individuals cannot directly gain savings resulting from their engaging in energy-conscious behaviour) bulk-metered units should be converted to individual metering. Unfortunately, individual metering is still substantially more expensive than bulk-metering particularly where existing bulk-metered units must be retrofitted. Few landlords have appeared interested in voluntarily pursuing such actions. The preferential bulk rate prices of energy also inhibit shifts to individual metering, since bulk-metered households may consume more, but, in some cases, pay less, than households in individually-metered units.

It is difficult to devise incentives for low income households to conserve gasoline. First, they already have extremely low levels of car usage, relatively high levels of transit usage, and

---

29. It is also important that low income groups, like other income groups, be provided with sufficient information to safeguard themselves against potential price "gougers" in the energy conservation and insulation businesses.

30. Under current Canadian rent regulation programs the costs which would accrue to landlords would be allowed in rent increase applications by landlords over a period of time which would vary from province to province.

less mileage per household. It is likely that there are good reasons why many low income individuals use cars; it is often too difficult or time consuming to reach their destinations by public transit.

Average auto energy efficiency could be increased by providing incentives to purchase energy-efficient vehicles and disincentives to purchase inefficient ones. Such incentives, as is shown in Table 13, are more likely to benefit higher income households who purchase three to four times as many cars per household and an even higher ratio for new car purchases.

Low income groups already have substantially lower rates of car ownership, higher rates of transit usage, lower potential for car/van pooling than higher income groups (the ideal car pooling situation is a relatively long work trip from the suburbs to another location) and have already cut down more in private car usage than high income groups. Therefore, programs in this area are likely to benefit medium and high more than low income households.

Mandatory product standards -- whether for houses, cars or appliances -- are often cited as key elements in any successful conservation strategy. There are two issues in assessing their distributional consequences. First, is the payback period or level of savings (or costs) of particular measures comparable to payback periods of low income households. Second, is the distribution of purchases, and hence savings in energy costs, associated with such measures. Table 13 shows that high income households purchase substantially more appliances and vehicles than do low income ones. Thus, savings/costs passed on by such programs will affect more high and medium than low income households.

Table 13

Expenditures on Appliances and Vehicles, 1978
(By Income Class)

Income Group	Purchase of Appliances			Purchase of Major Appliance*			Purchase of Automobile & Truck		
	Per Cent Reporting Expenditure	Average Expenditure	Average Expenditure per Reporting Household	Per Cent Reporting Expenditure	Average Expenditure	Average Expenditure per Reporting Household	Per Cent Reporting Expenditure	Average Expenditure	Average Expenditure per Reporting Household
$5,999 & Under	24.8	41.0	165.3	13.1	35.6	271.8	---	---	---
$6,000 - $7,999	40.8	68.9	168.9	20.5	57.0	278.0	---	---	---
$8,000 - $11,999	46.2	87.0	188.3	22.7	73.5	323.8	13.4	319.8	2,386.6
$12,000 - $15,999	51.7	126.9	245.5	28.6	109.7	383.6	23.3	684.1	2,936.1
$16,000 - $19,999	61.2	165.8	270.9	35.7	143.6	402.2	24.5	804.8	3,284.9
$20,000 - $24,999	60.3	185.7	308.0	35.9	161.5	449.9	28.5	1,031.9	3,620.7
$25,000 - $29,999	66.4	224.5	338.1	38.0	195.4	514.2	33.5	1,270.3	3,791.9
$30,000 - $34,999	71.3	256.9	360.3	38.5	225.4	585.5	27.6	1,241.8	4,499.3
$35,00 & Over	74.3	315.9	425.2	42.4	270.6	638.2	35.6	2,021.1	5,677.2
All Classes	56.7	170.9	301.4	31.7	147.7	465.9	23.5	907.7	3,862.6

*Includes refrigerators, freezers, cooking stoves and ranges, dishwashers, washing machines, dryers, vacuum cleaners and sewing machines.

Source: Statistics Canada, Family Expenditures in Canada, 1978.

Policy Assessment

Four federal programs were described above: the Canadian Home Insulation Program (CHIP); the Canadian Oil Substitution Program (COSP); the Residential Rehabilitation Assistance Program (RRAP) and the Canadian Home Renewal Program (CHRP), the latter of which expired in July 1983.

The CHIP program is clearly a successful program to the extent that it has delivered $950 millions to 2.5 million recipients in just a few years and that it has increased the thermal efficiency of the homes of grant recipients. It could, however, stand improvement on several counts. First, it may be income related, but it is not necessarily need related. Some grants have been made to tenants living in duplexes, but very few grants have gone to bulk-metered tenants, although they are eligible to receive it. Low income people still must raise the capital over and above the $500 to undertake needed improvements, and evaluations undertaken of the program have concluded that many low income persons have not taken advantage of it.[31]

Other problems have also been cited in program evaluations. Reductions in heating fuel use have been around 10 per cent, significantly less than the 25 per cent originally forecase by program planners. The role of private insulation contractors in the current delivery system has also been questioned. One study concluded that the degree of satisfaction with work done was significantly less than for non-CHIP users.[32] The same study concluded that,

---

31. Robert Fenton, "An Assessment of the Effectiveness of the Canadian Home Insulation Program," Winnipeg, Institute of Urban Studies, March 30, 1982.

32. Ibid, p.48.

"Consideration of several specific responses leads to the conclusion that the role of insulation contractors in disseminating the program may be greater than desired for an effective program of energy conservation."

There have been no comprehensive studies of the incomes of CHIP users, but the University of Winnipeg study cited above observed that the CHIP grant program could be more effective in reducing the burden of rising energy bills by targeting its delivery system more forcefully towards low income households, especially the large number of low income people that indicated significantly more than any other group surveyed that their homes did not need additional insulation. The study concluded that a sliding scale of grant ceilings may be appropriate.

The COSP program is subject to the same kind of criticism with respect to the relationship between grant amounts and need and income, although the fact that it is delivered mostly by local or provincial utility companies may result in a higher quality delivery system.

The RRAP and CHRP programs do vary grant amounts with income. In addition, grants are not taxable, making the relationship between grants and income easy to target, calculate and monitor. From an energy point of view, however, these programs are to a large extent irrelevant, as grant or loan (in the case of RRAP) recipients may improve the thermal efficiency of their homes, but they are not required to do so.

The provincial assistance programs, aside from the Alberta grant to senior citizens, all take the form of loans to pay for

energy conservation projects. They meet the needs of those low income households with sufficient current income to repay the loans. The loan programs do not benefit those low income households without the means to repay the loans. Only Nova Scotia and Quebec make available loans to tenants or landlords. All other provinces limit their loans to home owners.

The comments made above about the federal RRAP and CHRP programs also apply to the Ontario Home Renewal Program. Since the Ontario government has not provided additional funds for the program for the fiscal year ending March 31, 1984, this program's future is in some doubt.

Recommendations

The main conclusion of this report, and therefore its main recommendation, is that there is need to reformulate the CHIP program so that it becomes both an energy saving and socially reforming program by targeting grants more specifically to low income Canadian households. The new program could easily replace the COSP program as well, as the overall objectives of the two programs are similar. It would resemble the current RRAP and recently expired CHRP programs in that assistance would be tied to need and to income. The following features are suggested:

1) The grant portion of assistance would be related to income as in the CHRP. Maximum grants under the CHRP program in 1983 were 33 per cent of total project cost for low income households, declining to zero when household income reaches

$48,000. A higher maximum grant proportion, as much as two-thirds, would be appropriate for low-income households;

2) The balance of project cost not covered by a grant could take the form of a loan at Government of Canada long-term borrowing rates;

3) The program would cover both insulation and other items contributing to thermal efficiency and to approved equipment that would reduce energy use;

4) Standards testing capacity for both materials and methods would have to be increased considerably; and

5) The program, like the current CHIP, would be available to landlords, as well as home owners, as in the case of the RRAP program.

Future Research Needs

The lack of good data on energy use or on energy costs for low income Canadians made it necessary to make estimates for this report from data sources neither meant for this purpose nor entirely suitable to it. Yet the fact that energy prices are in some part set by government and the fact that the federal government and two or three provinces derive sizable portions of their total revenues from energy royalties, rents and taxes makes it imperative that the distribution and impact of energy costs be readily available. The

need to tailor assistance programs to the specific requirements of low income users makes it urgent that programs be constantly monitored as well.

The following suggestions for future research are intended to assist government planners in monitoring the impact of energy prices on low income households. An attempt has been made to integrate suggestions with existing government operations.

Survey of Urban Family Expenditures:

As this survey is undertaken periodically in any event, it would be quite easy and inexpensive to modify the output so that the kind of information derived in this report could be provided on a continuous basis. This information would provide an accurate picture of the incidence of energy costs by income class. As well, a dynamic picture of changes could be obtained as subsequent surveys were accumulated.

Income Tax Data:

Canadians have been receiving taxable grants under the Canadian Home Insulation Program since 1978 and under the Canadian Oil Substitution Program since 1981. While Revenue Canada publishes in its annual report, Taxation Statistics, numerous tables on income, tax deductions and tax credits for most items in the personal income tax returns of Canadians, the department has still not published information on the income characteristics of recipients of those grants. It is recommended that Revenue Canada commence doing so. This would be one of the easiest and most effective ways to monitor the income characteristics of those using government energy conservation assistance programs.

Data on Energy Use, Savings and Conservation:

To date no government in Canada has produced accurate or comprehensive information on conservation behaviour or the energy savings resulting from the receipt of CHIP and COSP grants by income class. The evaluation of CHIP by the University of Winnipeg's Institute of Urban Studies (under contract to Canada Mortgage and Housing Corporation) was supposed to include this information, but it was decided during the study that not enough time had elapsed for most recipients since they received the grant to obtain an accurate picture of the resulting energy savings. Macro studies of energy use suggest that the savings thus far falls far short of the 25 per cent level specified as an objective when the program was first announced. Research on this subject needs to be urgently undertaken.